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ABSTRACT

Papers include: the role of institutional research in the managerial revolution in higher education (W. Hugh Stickler); student studies in the institutional research program (W. Hugh Stickler); needed research studies in college admissions (Cameron Fincher); an introduction to budgetary analysis (James L. Miller); future enrollments and planning (L. Joseph Lins); projections for campus planning (L. Joseph Lins); and data reporting (L. Joseph Lins). (MSE)

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# INTRODUCTORY PAPERS

# on INSTITUTIONAL RESEARCH

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SOUTHERN REGIONAL EDUCATION BOARD

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# INTRODUCTORY PAPERS ON INSTITUTIONAL RESEARCH

Edited by

E. F. Schietinger

SOUTHERN REGIONAL EDUCATION BOARD
130 Sixth Street, N.W.
Atlanta, Georgia 30313
1968

# FOREWORD

Southern Regional Education Board staff were among the earliest to initiate the promotion, at a national level, of the institutional research concept. Beginning in the year 1960, some ten regional meetings have been co-sponsored by SREB on this topic -- introductory orientations to the general area of institutional research, special conferences on sub-topics such as student studies, concentrated workshops on institutional research. Several volumes of partial or complete proceedings have been published by the Board.

The Athens Workshop on Institutional Research, co-sponsored with the University of Georgia, July 16-20, 1967, resulted in the present set of papers. Although the volume of publications on institutional research multiplies year by year, there is still a dearth of materials suitable for the purpose of orienting the newcomer into the field. In light of this vacuum, treatments such as the present report can fill a most useful function. The educational administrator should be fully aware that there can be no permanent codification of procedures in a field which must remain in the forefront of the changing while change itself is the watchword of higher educational relevance to the modern world.

Winfred L. Godwin
Director

# PREFACE

The keynote of the Athens Workshop on Institutional Research was set by W. Hugh Stickler, quoting Rourke and Brooks (1966),[1] ". . . institutional research is a variegated form of organizational self-study designed to help colleges and universities gather an expanding range of information about their own internal operations and the effectiveness with which they are using their resources." The concept of continuing self-study is central to this definition. The emphasis upon the colleges' and universities' "own internal operations and effectiveness" places the focus on the individual institution rather than upon higher education in general. This workshop was indeed planned for personnel in the field of applied institutional research, rather than for students interested in the broader and more basic field of research in higher education. It was designed as an introduction to some half-dozen topical fields[2] in which self-study, conducted or organized by a central institutional research office, has become most widespread today.

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[1] Throughout this report parenthetical notation is used in citing references listed at the end of each paper. See end of first paper for source of above quotation.

[2] In a discussion not available for inclusion in this volume, the field of campus planning and facilities analysis was treated by James I. Doi, Professor of Higher Education, University of Michigan. Other workshop presentations which do not appear here are a panel discussion on "Organization for Institutional Research," moderated by Galen N. Drewry, Director, Institute of Higher Education, University of Georgia; and a panel discussion on "Issues of Implementing Institutional Research," moderated by A. J. Brumbaugh, Consultant, Southern Regional Education Board.

Stickler's paper on student studies reviews the general dimensions of the first topical field, providing a feel for the kinds of problems which have animated recent research on student populations. For the institutional researcher who is wondering where to start, Stickler's practical suggestions on "bolts and nuts" in student studies offers possibilities. The first category--"routine and repetitive data gathering"--is, in fact, the indispensable point of departure for any on-going program of institutional research which is to be responsive to the types of questions which are commonly directed to offices of institutional research. The problem of how to systematize "routine and repetitive data gathering" without this activity becoming an end in itself proved to be a theme which recurred. Incidentally, when queried on the relative importance of the respective institutional research topics to their own responsibilities, the greatest number of Workshop participants chose student studies as paramount.

In his presentation on faculty studies John E. Stecklein details alternatives for systematizing the data gathering function entailed in the measurement of faculty load. Obviously the local situation will affect the selection of alternatives. The study of faculty load through structured reporting procedures illustrates a salient point which emerged in the course of the discussions: it was noted that the educational operation, which should be a dynamic, enlarging process, may in fact be subjected to restrictions and boundaries imposed by the definitions required for institutional study. That the "expanding range of information" which the colleges and universities gather may in fact influence the nature of the educational operation was implied by Stecklein in his review of purposes for which faculty load studies may be conducted.

If the institutional research operation is sometimes suspected of imposing an implicit threat to the vigor of the educational process, an even more frequently occurring source of perplexity seems to be that of the explicit role of the institutional research officer vis-a-vis policy implications of institutional research findings. Cameron Fincher deals with a topic which might be particularly conducive to ambivalences in this regard. His presentation suggests that the study of factors having to do with the admissions process need not be a sterile preoccupation with minute differences in degree of precision attained in predicting success in college. The more provocative questions which admissions researchers may ask are in fact the bread and butter questions of many a college and university: Who shall be admitted and how shall the admissions decisions be justified? What recruitment practices are indicated? And so forth.

There is a school of thought which maintains that analysis of any question may result in completely objective findings, the interpretation of which may be confined to a series of statements reviewing each possible course of action and a description of its consequences. Fincher's discussion appears to make abundantly clear, however, that merely raising certain questions for study may itself connote more definite commitment to a point of view by a researcher than will any of the possible answers which his findings may yield.

The paper on institutional research and institutional budgets concerns the topic, among those treated at this workshop, which is perhaps least often an object of analysis by institutional research offices. But if institutional research concerns the "effectiveness with which the colleges and universities are using their resources," then the finances of the institutions certainly constitute a crucial topic of analysis. If such analysis is not conducted by the office which performs most studies in an institution, there needs to be especially close liaison between that point and the office which conducts fiscal analyses. Ultimately, all of the institution's resources derive from money, and the language for evaluating effectiveness of resource utilization is the language of the ledger. James L. Miller, Jr. underscores the requirement that fiscal analysis be congruent with academic values, a goal which may well involve close participation of institutional research personnel as well as faculty in the framing of categories used in reporting fiscal data.

Implied in almost any rationale for institutional research would be the concept of change. There is no justification for studying the internal operations of an institution except in the expectation of bringing about improvements or of planning for growth--usually both. Thus, in a real sense, the quantitative outcome of institutional research is the construction of projections--projection of enrollments, projection of programs, projection of faculty requirements, projection of facilities needed. Until the institutional research officer can measure and express in numbers the subjects which he studies, his institutional research is indeed of a "meager and unsatisfactory kind."

L. Joseph Lins, in his presentation on projections, has concentrated a large volume of methodological "nuts and bolts" material of value to institutional research personnel. His final paper on data reporting contains technical suggestions which are not solely applicable to the needs of institutional research operations; the topic of data keeping and reporting was included on the program of the Athens Workshop on Institutional Research to emphasize that the accumulation of organized factual material is prerequisite to the operation of institutional research activity on any campus. Whether this accumulation comes about through a simple set of manually recorded files or whether it occurs by virtue of a sophisticated computer system, it provides the "expanding range of information about the internal operations of the colleges and universities and the effectiveness with which they are using their resources," which justify the effort and resources required in conducting institutional research.

E. F. Schietinger
Associate Director for Research

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# THE ROLE OF INSTITUTIONAL RESEARCH IN "THE MANAGERIAL REVOLUTION IN HIGHER EDUCATION": AN OVERVIEW

W. Hugh Stickler
Department of Higher Education
Florida State University

Institutional research is a relatively new phenomenon in American higher education. A decade ago there probably were not more than a score of bonafide institutional research offices in the entire country. Today if we include junior colleges, senior colleges, and universities -- the totality of American higher education -- institutional research offices are probably numbered in the several hundreds. And the number is increasing dramatically. But let us not get ahead of our story!

During the first two or three hundred years of higher education in America, colleges and universities did very little in the way of studying their own operations and problems. In general, institutions were small and operations were relatively simple. As President Emeritus Doak S. Campbell of the Florida State University once put it to me, "In those days institutions of higher learning could and did fly by the seats of their pants."

But the days of simple operations in institutions of higher education are over. Enrollments are skyrocketing, costs are mounting by leaps and bounds, programs are expanding, colleges and universities are seeking to understand and to identify more completely with the clientele they serve, students are restless, curriculums are proliferating, research is waxing, competent faculty members are in low supply and high demand, and operational problems have increased both in number and in complexity. New looks at objectives must be taken, new policies must be formulated, new plans must be developed, new administrative procedures must be employed, new teaching techniques must come into being, and new evaluative techniques and devices must be put into operation. Even completely new institutions must be built. I need not tell you people that operating an institution of higher learning today is an infinitely complicated job. In order to operate effectively our junior colleges, senior colleges, and universities need all the help they can get. At least a part of this help is forthcoming through self studies in the form of institutional research. Some writers--Rourke and Brooks (1966) among others--speak of institutional research as being an integral part of the "managerial revolution" which has come to college and university administration within the past 10 or 15 years. In fact, say Rourke and Brooks (1966):

> Institutional research lies at the heart of the trend toward the use of modern management techniques in higher education. While the nature and scope of this kind of activity has tended to elude precise definition in the past, it can be said that institutional research is a variegated form of organizational self-study designed to help colleges and universities gather an expanding range of information about their own internal operations and the effectiveness with which they are using their resources. By collecting such data, institutions hope to make informed judgments instead of guessing or relying on the intuitions of the administrator in framing decisions on university policy.
>
> In place of the loose, unstructured, and somewhat casual methods of management practiced in colleges and universities in the past, we have seen a growing commitment to the use of automation in the routine processes of administration, an increased resort to data gathering and (institutional) research as a basis of policy making, and an expanding effort to develop objective criteria for making decisions on the allocation of resources instead of leaving these matters entirely to the play of campus pressures or the force of tradition.

What top administrators and governing board members want nowadays is the kind of analyzed and classified information they need for making policy and regulatory decisions on a sounder basis than hunch or pure intuition alone.

As discussed here, institutional research refers to research which is directed toward providing data useful or necessary in the making of intelligent administrative decisions and/or for the successful operation, maintenance and/or improvement of a given institution of higher education. It includes the collection and analysis of data used in appraising the environment or "setting" in which the institution operates, in preparing the budget, in planning new buildings, in assigning space in existing buildings, in determining faculty loads, in admitting students, in individualizing instruction, in planning the educational program, in keeping abreast of student progress, and the like. It is needed to facilitate efficient operation, but it is also needed to promote qualitative improvements.

The activities and effectiveness of institutional research agencies vary appreciably in terms of several factors:

First, the interests and aptitudes of the man in charge set the direction of the research. At present it is possible for an able, strong person to leave a substantial imprint upon the office of institutional research, and, as a result, upon the institution he serves.

Second, external pressures and emergencies, often having to do with demands from legislatures, supporting constituencies, or from the general public, can set the pattern of the research. In most cases, such current demands leave little time for the office to take "the long look" in helping presidents and governing boards plan ahead for the years to come.

Third, repetitive tasks of one sort or another take a lot of time -- for example, space utilization studies, cost studies, assembling enrollment statistics, distributions of faculty loads, and analyses of student grades. Such data are valuable in setting trend lines over the years, but the agency's staffing should be adequate to permit other kinds of studies as well.

Fourth, "senatorial courtesy" keeps some institutional research agencies out of certain areas of possible research, such as the evaluation of teaching and other aspects of the educational process which traditionally have been the province of the faculty. There is tendency to avoid "controversial areas."

Fifth and last among these examples of influencing factors is the problem of how to organize and administer institutional research. Probing questions threaten comfortable old ways, increase feelings of insecurity in administrators and faculty alike, and reveal "skeletons in the closet" to critical outsiders. Continuing self-examination is not easy to take! Diplomacy and professional integrity of the highest order are required to achieve good research results in the face of these difficulties. But the job can be done! I shall have more to say on this point later in this presentation.

Institutional research may be either basic or applied. In practice it is usually applied; it deals primarily with the on-going operational problems of the institution. As A. J. Brumbaugh (1960) describes it, it is "research designed to improve institutions of higher learning."

The idea of institutional research is not new although the designation has not always been thus and although implementation has been slow until recently. Here and there a president, dean, business manager, registrar, or other officer for years has been making regular and/or occasional institutional studies. At the institutional level Stephens College has had an organized institutional research service for upwards of half a century (since 1921). The University of Minnesota and the University of Illinois, among others, have operated organized self-study programs for several decades.
As a national movement, however, institutional research has developed rapidly only since the end of World War II and especially during the past 10 or 15 years. Only within the past decade or so has the term "institutional research" gained consistent and wide currency.

That there is growing interest in institutional research among the junior colleges, senior colleges, and universities of this country is indicated by an abundance of evidence. I shall mention only five matters in this regard. First, a number of major conferences, institutes, and workshops -- perhaps a dozen or more -- have now been held and have been well patronized. Among others three earlier institutes on institutional research sponsored by the Southern Regional Education Board -- held at the Florida State University, at the University of Texas, and at the University of Kentucky in that chronological order -- enrolled far more persons than were originally anticipated. And just last summer a splendid two-week workshop at the University of Texas was operated by SREB for a limited enrollment.

Second, there is now a national forum on institutional research. Although it began as an informal gathering of a dozen or a score of persons in a hotel room in Chicago, it has now grown to a group of several hundred institutional research workers. Last spring (1966) in Boston the group designated itself the Association for Institutional Research (AIR) and adopted a constitution. Earlier this year the Association met here at the University of Georgia. So now it is a going concern. If the participants in the Workshop are not already members of AIR I would strongly recommend that you consider affiliating with this fine new organization.

Third, both the American Council on Education and the U. S. Office of Education have established offices to facilitate institutional research work throughout the country. The Council through its Office of Research (formerly the Office of Statistical Information and Research) maintains an invaluable Fact Book on Higher Education in America which it keeps current through a loose-leaf information service. Through a unit which it calls the Clearinghouse on Studies on Higher Education the U. S. Office of Education records and distributes information about completed institutional research projects. It also digests these researches and reports them in monograph form in its excellent series entitled New Dimensions in Higher Education.

Fourth, Educational Testing Service has recently activated an Institutional Research Program for Higher Education. In announcing the new Program ETS stated, "This new service . . . will provide research instruments as well as data processing and consultant services to be used in programs of institutional self-study and evaluation." The services of the Program will undoubtedly be expanded in the future.

The fifth evidence of growing interest in institutional research is revealed in the rapidly expanding literature in the field. This is neither the time nor the place to discuss this literature at length, but in addition to the publications just noted I should like to mention two others. One of these is entitled Research Designed to Improve Institutions of Higher Learning by A. J. Brumbaugh (1960). This little publication has already served a useful purpose and Dr. Brumbaugh tells me it is now being revised and expanded. The other document -- of particular interest to institutional research workers in junior colleges -- is entitled Institutional Research in the Junior College. It grew out of a junior college conference on institutional research at the University of California at Los Angeles and is available through the Students Store at that institution.

The volume of institutional research undertaken by a given institution varies from none to very substantial amounts. The character of the research runs the entire gamut of educational problems. Through the years the Office of Institutional Research and Service at the Florida State University has provided -- as time and resources have permitted -- services to the President's office, the Board of Regents, the office of the Vice President for Academic

Affairs, the Council of Academic Deans, the faculty, graduate students, federal agencies, state agencies, the public schools of the state, and other institutions of higher education. In this institution studies made over the years fall into such categories as (a) administrative problems and procedures, (b) budgets and factors related to budgets, (c) class size analyses, (d) operational costs and factors related to costs, (e) curriculum, (f) degrees awarded, (g) enrollment analyses and projections, (h) grading practices, (i) instructional staff, (j) faculty salaries, (k) space inventories and space utilization, (l) student abilities studies, (m) student characteristics and backgrounds, (n) student costs, (o) student progress, (p) faculty loads, (q) time utilization, (r) studies of transfer students and (s) "miscellaneous studies"--i.e., studies which do not seem to fall into any of these categories. It may be added, too, that the institutional research agency in this institution always has had a long backlog of work waiting to be done. The Florida State University may or may not be representative. Reference is made to it here to illustrate that the variety of problems falling within the scope of institutional research is almost endless. It is, of course, entirely appropriate and desirable that each institution should determine and attack its own problems to serve its own purposes.

It seems to me that if I were a college or university administrator I would want especially to have at hand as "working tools" the results of far-reaching institutional research. Not only would I want research findings in most or all of the areas listed above; I would also want to learn much about the clientele served by our institution, to find areas for legitimate educational services for adults, to explore new avenues to research in the subject areas, to understand the origins and backgrounds of our particular students, to develop meaingful programs in general education, to follow the progress of our students, to know what happens to our students -- particularly those who transfer to other institutions -- after they leave our college. It seems to me I could easily think of a thousand and one things I would want to have done in the area of institutional research. I do believe that without half trying I could keep an institutional research agency in my college or university busy for a hundred years!

It is important that we not get the idea that institutional research is desirable only in senior institutions and especially in big universities. I am trying to say that institutional research findings are fully as effective in junior colleges as in senior institutions and that size has little or nothing to do with it. When I left Stephens College in the late 1940's I was informed by the late W. W. Charters, then director of the research service, that somewhere between 800 and 1,000 pieces of institutional research had been completed at that time. By now the number of completed research projects would probably be twice that figure. Stephens College -- still primarily a junior college, please note -- simply could not be what it is today without its institutional research program.

Institutional research reports run the full gamut of sophistication. Some are so informal that they are reported orally, usually to the president or some other administrative officer. The ultimate in simplicity of reporting probably came from a director of institutional research in a state university who said, "I worked on the problem for three months and the answer was 'No'! It was as simple as that." Some institutions have never published an institutional research report, nor do they intend to do so. Rather they think of institutional research as being for their particular college or university and not for public consumption.

The typical institutional research agency, however, uses a variety of forms of reporting. In some cases the report is informal, possibly even made orally. In other cases the report is simple -- a table, a graph, a chart, a page or two of information. Most often, the report is made in typed or duplicated-copy form and distributed to those people within the institution to whom the new information is likely to prove most useful. In still other cases -- usually few in number -- the findings prove to be of such value that they merit sharing with the profession. These reports are then published -- in full or in summary form. The publication outlet may be a book, a monograph, a "house organ" type of publication, or an article in a professional journal. The institutional research operation at the University of Minnesota, for example, is notable for the large number of fine "permanent" publications it has produced through the years.

I am of the opinion that institutional research findings ought to be reproduced in at least "semi-permanent" form (e.g., mimeograph, multilith, or the like) and fairly widely distributed, particularly within the institution being served. As long as I directed the research service at the Florida State University, our office distributed within the University every year or two a little, inexpensive publication entitled Services and Materials Available From the Office of Institutional Research and Service. Periodic internal distribution of some such document still seems to me to be a good idea.

But in any event -- and this I want to emphasize --journal publication is not the important thing. Rather, publication is frequently incidental. Of the 800 - 1,000 studies completed at Stephens College by the late 1940's I do not suppose that more than 25 -- at most 50 -- were ever published. They were not designed with the end goal of professional publication in mind. They were, rather, (in Brumbaugh's terms) "research designed to improve an institution of higher learning." The late W. W. Charters described this kind of research as "educational engineering" -- research designed to be plowed right back into the educational program in order to improve the overall operation of the college. "Educational engineering" -- I have always liked that term!

Two studies, one by Hall T. Sprague (1959) and the other by W. Hugh Stickler (1959) reveal that, organizationally, different educational institutions provide for institutional research in different ways. Some schools do little or no institutional research and therefore have no formal organization concerned with it. In other colleges and universities institutional research is still decentralized. In these institutions officers (e.g., vice president, provost, administrative assistant, dean, business manager, internal auditor, registrar, and others), faculty and staff members, and/or committees participate in the self-study process. In a substantial and rapidly increasing number of colleges and universities, however, institutional research is performed, coordinated, and/or reviewed by institutional research agencies. In these instances each agency has a director (full-time or part-time) and a staff (usually small -- i.e., consisting of one to five or six persons in addition to the executive officer). Not infrequently institutional research agencies are assisted by institution-wide advisory committees. In general, these advisory committees serve highly useful functions in the overall operations of institutional research programs.

Without doubt, the current trend nationally is toward the centralization of institutional research functions. The advantages of such an organizational arrangement are substantial. It is the observation of this writer that those institutions which have identifiable and on-going institutional research agencies are turning out more and better institutional research information, both that which is "routine" and that which is particular, both that which is repetitive in nature and that which is discrete.

No doubt you are interested in the question: "How much does it cost to operate an institutional research agency?" The answer is, "Not much!" I know one state university which, formerly at least, took some pride in the fact that it had no budget for institutional research. The director was paid, I believe, by the department of psychology -- possibly in part by the office of the president -- and the rest of the money was forthcoming from the departments and campus agencies for whom services were performed. I cannot believe that is the best way to do it, but the scheme seemed to work reasonably well in that particular institution. Preferably a modest sum will be set aside specifically for the purposes of institutional research. It is difficult to estimate the annual cost for an institutional research program in a college or university. It will, of course, depend upon the size of the institution, the amount of research planned, and the degree of research sophistication expected. I should think, however, that a lot of good could be done with an annual budget of $25,000 in a small school to $75,000 in a large institution, and at that price I am of the opinion that the deal is a real bargain! In fact, I think an institutional research effort of this magnitude will pay for itself many times over through improved institutional operations. And if the conviction exists that institutional research is worthwhile, the money to support it is likely to be forthcoming.

In developing a program of institutional research a junior college, senior college, or university will do well to keep in mind several guiding principles. Among the more important of these principles are the following (and I list seven of them):

a. Institutional research must be planned. If this is "research designed to improve institutions of higher learning," then crucial issues must be identified, priorities must be assigned, and research projects must be designed and conducted. These things do not just happen; all of these functions require careful and thorough planning.

b. Responsibility for the direction, coordination, and review of institutional research should be centralized. Brumbaugh (1960) notes that "the lack of central coordination is likely to result in wasteful duplication or costly oversight of needed studies." Only in a recognized institutional research agency can a unified and comprehensive program of institutional research be developed and made to function effectively.

c. The executive officer of the institutional research agency should report to a major institutional officer, preferably the president. I make this recommendation knowing full well the unfortunate difficulties which sometimes exist between faculty members and administrators. But the fact remains that many of the research projects will deal with major administrative problems and all or nearly all will have institution-wide significance. Some will be confidential in nature. High administrative placement will give the institutional research agency the status it must have in order to gain access to the multifarious raw data it will need in pursuing its research program.

d. An institution-wide advisory committee should assist the institutional research agency in carrying out its responsibilities. Such a committee can be helpful in identifying and screening problems, designing research projects, assigning priorities, and interpreting the work of the institutional research agency to the rest of the college or university and its constituency. For more than 30 years an advisory committee on institutional research has rendered valuable service at the University of Minnesota.

e. Provision should be made for wide participation by faculty members and administrative offices in planning and conducting institutional research projects. This principle should apply even though the major responsibility for institutional research is centralized. Institutional research offices are not agencies unto themselves. Widespread staff participation in institutional research familiarizes the individual with the problems of the college or university and prepares him to deal realistically and effectively with the research findings. May I say in passing that most of the institutional research performed at Stephens College through the years has been done by faculty members working in cooperation with the research service.

f. Activities of the institutional research agency must be carried out at the highest levels of professional ethics. This point was suggested earlier. If not handled with diplomacy and professional integrity, the constant probing which is a necessary ingredient in institutional research may tend to irritate colleagues and to develop feelings of insecurity at all levels in the academic hierarchy. Therefore, confidential matters must be kept confidential. Institutional research workers should know many things they do not talk about; and if they do talk too much they will ruin the entire institutional research operation and make themselves very unpopular in the process. This leads me to perhaps my firmest suggestion or bit of advice: Do not pontificate! An institutional research person should be characterized by modesty and humility, not by verbosity nor bellicosity. It is his business to discover facts, not to determine what shall be done with the information he uncovers. That prerogative belongs to others in the academic community -- chiefly the president and other administrators. Let them interpret the significance of the research findings, make the appropriate decisions, and initiate the appropriate action.

g. Institutional research must be adequately financed. Institutional research agencies are service agencies. Their effectiveness is to be judged in terms of the volume and quality of the services they provide. But remember: this is "research designed to improve institutions of higher education." If institutional research agencies do their work well, adequate financial support is justified and should be forthcoming. What constitutes adequacy will, of course, be interpreted by each institution in terms of its own needs and its own program.

Now let me summarize and conclude. I begin this summary by quoting two paragraphs from a speech by President Logan Wilson of the American Council on Education. In an address at the opening session of the Fourth Quadrennial Convocation of Christian Colleges at Earlham College on June 20 of last year (1966) he said:

> Although at present the percentage of educational fund spent on research about education is absurdly small compared to the proportional funds which business and industry spend on their research and development, we are at least aware that education is no less amenable to research than other areas are. To be sure, some academicians still seem to feel that education is too mystic and sanctified to be investigated by the same methods we use to study and judge other kinds of reasoned endeavor, and that to apply anything akin to unit costing or to the economic input-output analysis is a desecration. But fortunately this attitude is on the wane, and we are beginning belatedly to develop a technology of higher education.
>
> The curriculum is no longer regarded as a sacrosanct heritage from the past; it is currently the subject of rational analysis and reform along more functional lines. We are developing better criteria for the assessment and improvement of teaching. The effects of class size and composition on learning, the valid uses of television and programed instruction, the proper balance between teaching and research, all of these are becoming problems for empirical inquiry rather than issues for endless debate. New psychological theories of learning are being applied in the classroom, and there are evidences of the emergence of an economics of education. On many campuses, bureaus or offices of research -- (and he is talking about institutional research) -- are undertaking systematic studies of the institution itself as an environment.

Today higher education is more complex and more concerned with excellence than ever before -- excellence in operation and excellence in programs. In order to develop and/or to maintain excellence, governing boards, administrators, and faculties must make important decisions concerning the institutions of higher education for which they are responsible. In dealing with many operational and educational problems institutional research can provide pertinent data upon which intelligent decisions can be made.

Junior colleges, senior colleges, and universities all over America are finding institutional research agencies to be helpful -- even indispensable -- in successfully maintaining and improving their operations and educational programs. Because of their proven usefulness in institutions which already have them, there is every reason to believe that more and more American institutions of higher education will establish and/or expand institutional research programs in the years which lie immediately ahead. I am confident that many of the junior colleges, senior colleges, and universities represented here today are or will be among that number. The participants in this Workshop on Institutional Research may very well indeed make substantial contributions to "the managerial revolution in higher education" which is now under way.

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# STUDENT STUDIES IN THE INSTITUTIONAL RESEARCH PROGRAM

W. Hugh Stickler
Department of Higher Education
Florida State University

The long-awaited tidal wave of students is now upon us. Last fall (1966) nearly 6.5 million students were registered in America's 2,337 junior colleges, senior colleges, and universities (Opening Fall Enrollment, 1966). By 1970 this number will probably go to 7.3 million, by 1975 to perhaps 9.0 million (Projections of Educational Statistics, 1966).

At the same time when we are confronted by these huge enrollments, colleges are trying desperately to place added emphasis on the individual student -- his needs, his wants, his abilities, his basic personality characteristics, his impulses, his responses. Following the expressed unrest of students in recent years, we are coming to realize afresh that institutions of higher learning actually are created and operated for students -- that students are the most important commodity with which we deal. Thus, if we as educators are to see students individually rather than as a sea of banal, blank, and indistinguishable faces, we must know more about the distinctive components of the tidal wave of students. Moreover, we must know more about the college environments in which students live and work. What does research have to say to us now about college students and college environments?

## Extent of Research

For some time we have known a good deal about individual differences among students. But research about student groups and college environments and about relationships between the two has been slow in getting started. Only now are such studies beginning to flow in quantity. In fact, so much research has been done in these areas since Jacob's rather gloomy report in 1957 that I cannot possibly cover all of it in one speech. Consequently, I shall skip hurriedly over a number of fairly recently completed studies, then consider a smaller number of studies in some detail, and conclude with some comments on the role of institutional research in student studies.

Perhaps here at the beginning of this paper I should note and commend to you three publications. The first is entitled Research on College Students (Sprague, 1960). It is a compilation of the papers presented at the 1960 Berkeley Summer Institute sponsored by the Western Interstate Commission for Higher Education and the Center for the Study of Higher Education (at Berkeley). The second is entitled Institutional Research on College Students (Wilson, 1962). This is a compilation of the papers presented at the Swannanoa Conference in 1961. The Southern Regional Education Board and the Southern College Personnel Association were the sponsors. The third is Nevitt Sanford's monumental volume, The American College (1962a), in my judgment an extremely important and useful piece of work. These three publications should get you off to a good start in your own institutional research undertakings in the area of student studies.

As research results accumulate, it becomes evident that the American college or university is a social institution affected and infected by the great complexities, uncertainties, and differences found in our larger society and culture, as well as by a complexity of forces within the college system itself. Sanford observes in The American College (1962a), "If our culture and our society are to be changed at all by the deliberate application of intelligence and foresight, no agency has a better chance of initiating change than our institutions of higher learning. That follows: we try to deal in intelligence and foresight. Such change he believes can take place only if we possess "sufficient knowledge of the processes of higher education and sufficient conviction about purpose." It is an attempt to gain this "sufficient knowledge" that is guiding student studies.

In general, student studies range from factors motivating students to enter college (Douvan and Kaye in Sanford, 1962a) to interviews with alumni twenty years after graduation (Freedman in Sanford, 1962a), from attempts to determine the teaching methods by which students learn best (McKeachie in Sanford, 1962a) to an exploration of the sub-cultures at various institutions and their effect on students (Pace, 1963b).

To review some highlights illustrating the diversity, complexity, and extent of research, I cite the following. Douvan and Kaye found that going to college is taken for granted by many young people from upper-middle and middle-class homes, while college attendance to "those on the borderline of economic ease" is the way to improved social and economic status. They also found that boys viewed college more vocationally than did girls, that boys who attended college were more self-reliant than boys who did not; but that there was no such distinction between college-bound and non-college attending girls.

McConnell and Heist (in Sanford, 1962a) discovered relevance between characteristics of entering freshmen (other than ability) and their college performance and achievement and educational goals. Sanford (1962a) concluded that college freshmen develop when confronted with challenges requiring new types of adaptive responses and when "freed from the necessity of maintaining unconscious defensive devices."

Freedman (in Sanford, 1962a), studying first-year students at Vassar, found that variations in background and contemporary situations led to different impacts upon different girls by the first few weeks of college.

It can be concluded from findings by Stern (in Sanford, 1962a) and others that students with strong authoritarian tendencies often leave college if they fail to find support in a satisfactory peer group. The powerful impact of peer groups on students in general and some suggestions concerning its use in achieving educational objectives are reported by Newcomb and Wilson (Newcomb, 1960). More will be said about peer groups later in this paper.

Procedures and techniques of teaching have been rather extensively and relatively indecisively explored (McKeachie in Sanford, 1962a). Even yet we really know very little about the teaching-learning processes at the college level.

Intensive clinical studies at Vassar and Yale indicate that individuals grow dramatically in intellectual achievement "as a consequence of a favorable pairing of personality determinants and the environmental characteristics of a given college (Brown in Sanford, 1962a)."

Here in Georgia, John R. Hills (1962) reports that the same tests have not proved equally accurate predictors of college success for both Negro and white students.

I could go on and on citing research in student studies for as my colleague, Dr. Melvene Hardee (1962), said a few years ago at the Southern Regional Education Board Conference at Swannanoa, North Carolina: "So it is, the (student) worker in higher education finds himself at the shore's edge of a live sea of facts and forecasts. Through these he must propel himself -- or drown in an ocean of information, engulfed by his own ignorance. (Student) workers, with little time to meditate and with much pressure upon them for quantity production, seek a Moses to chart the course." I do not know who is going to play the role of Moses in this drama, but I am sure that institutional research workers can be helpful in the situation.

In mentioning the research cited above, I have not meant to imply that all areas have been researched or that all research is definitive. Actually, the situation is quite the opposite. Many studies are limited in scope and questionable in validity; many have been made only once and not always under controlled conditions. Still, assuming at least most of them to be valid, reliable, and definitive, their value remains nil unless the findings are adapted by educators and educational institutions. I said "adapted", not adopted, for application consistent with institutional goals and purposes will determine the value of research findings.

## Specific Studies in More Detail

Not only is student research becoming more voluminous; it is also becoming more and more complex, more and more sophisticated, and more and more significant. Let me elaborate.

For many years educators and behavioral scientists -- particularly psychologists -- have been concerned with individual differences among college students. What was once a frontier is now familiar territory. This concern has resulted in the development and use of many educational and psychological tests -- tests of college aptitude and of special abilities, a large array of achievement tests, and measures of interests, attitudes, values, and personality. We now know very well that college students differ enormously in nearly every characteristic we have been able to measure. And this knowledge has shaped many educational policies and practices -- selective admissions, advanced placement, differential instruction, honors programs and remedial programs, counseling and guidance.

Yet today, new research, more complex and more penetrating, is greatly enriching our understanding of the significance of these individual differences. This more penetrating research reflects also a changing emphasis appropriate to the times. The emphasis now is less on measuring and describing individual differences -- important though they may be -- but more on understanding the diversity of higher education and the development of the talents of individual students as matters of national importance. In other words, the concern now is getting the individual student with his particular characteristics into the institution with the particular academic environment which will enable that student to develop most effectively. The old frontier of individual differences has led us to the newer frontier of diversity and individual development in differing academic environments.

When one goes beyond the simple measurement provided by a good scholastic aptitude test, and gets into more complex measures of values and interests and intellectual dispositions, one finds that there are very important personality differences among students who are not significantly different in terms of scholastic aptitude test scores.

For example, in the report of a very intensive study of 36 representative students at Princeton University, involving more than 1,000 interviews and numerous group discussions over a four-year period, Heath (1959) described four types of students, all having good ability. One was the noncommitted type -- cool, distant, and very hard to reach educationally. Another group was composed of the hustlers -- active, agressive, and success-oriented. To reorient these students toward academic and intellectual goals and toward a deeper self-understanding requires, he says, "a calamity." The third group was composed of the plungers -- spontaneous, over-active, impulsive. To change these students requires a great deal of tolerance and patient understanding. The fourth group was really the educators' ideal. Heath called this group the reasonable adventurers -- interested in their subjects, close to their friends, reflective, tolerant, and with a benign sense of humor.

Or note a kind of selectivity -- until a few years ago unknown -- which occurs in medical schools. This study was made at the Center for the Study of Higher Education at the University of California at Berkeley. On the Allport-Vernon-Lindzey scale of values one group of three medical schools had seniors who, in common, had relatively high scores in both theoretical and aesthetic values, well above the mean of college students generally and the aesthetic scores well above the mean of seniors in other medical schools. Another group of medical schools had seniors who had relatively high theoretical scores but just average aesthetic scores. And a third group of medical schools had seniors whose theoretical scores were a little above average but whose aesthetic scores were considerably below average. It is not surprising -- is it? -- that the first group of medical schools, whose seniors were unusually high on both theoretical and aesthetic values, produces a large number of teachers and researchers in medicine. Nor is it surprising that the last group of medical schools produces more than the usual number of general practitioners.

These and other studies lead us to an important conclusion: students with different temperaments respond in different ways to different treatments -- to different academic environments, if you will. And this leads us to a consideration of diversity in college environments. First, let us look at differences in environments insofar as the ability levels of students are concerned.

The diversity of college student bodies, and the differences in student characteristics from one college to another, have been persuasively documented by research from the Center for the Study of Higher Education at the University of California at Berkeley. In a carefully stratified sample of 200 colleges and universities across the land (a 10% sample) John Darley (1962) found that mean scores on the ACE Psychological Examination for entering freshmen ranged from 38 to 142, a range of approximately four standard deviations. Translating these mean socres to published percentiles for individual students, the lowest school in this sample had an average performance equal to a percentile rank of one; the highest school's average was equivalent to a percentile rank of 92. Imagine that! -- an institution whose average student ranks ability-wise in the first percentile and another whose average student ranks ability-wise in the 92nd percentile. And all of it is going on in the name of American higher education!

Moreover, there were sharp geographical differences in the Darley study. In the Northeast 44 out of 51 schools stood in the top half and 30 out of 51 schools -- better than 60 per cent -- stood in the top quarter on national norms. On the other hand, 50 out of 65 schools in the South stood in the bottom half and 33 out of 65 -- more than 50 per cent -- stood in the bottom quarter on national norms. And, in case you missed the point, let me say again that these are the average scores of institutions, not the scores of individual students. Even among institutions that are broadly similar in structure and purpose there are tremendous differences in the college environments insofar as ability levels are concerned.

Now let us look at other environmental differences among colleges and universities. Stern and Pace, working at the time at Syracuse University although Pace has since gone to the University of California at Los Angeles, developed an instrument known as the College Characteristics Index (CCI), a sort of a personality test for colleges and universities. It consists of 300 true-or-false items which students mark as they evaluate the environment of their own institutions. From extensive and intensive studies using the CCI, as it is now commonly known, the authors summarized the characteristics of five basically-different college environments as follows (Pace, 1960b):

> The first is predominantly humanistic, reflective, and sentient. College is an expanding intellectual experience, testing the limits of curiosity about new ideas, new sensations, new capacities, and self-understanding. The second, equally demanding and vigorous, is predominantly scientific and competitive, requiring a high degree of individual concentration for survival. The third is practical and applied, concerned with inter-personal and extra-personal status. In the pursuit of utilitarian goals, one's relationship to authority and the gaining of privileges and visible rewards are important. The fourth type of environment is strongly other-directed. There is a high level of concern for group welfare, friendships, organization, and social responsibility. The fifth type is aggressive and impulsive, in rebellion chiefly against the other-directed, highly socialized community.

Pace also summarized his findings concerning relationships among these different types of college environments:

> The variables which push toward intellectual expansion and achievement, whether humanistic or scientific, correlate positively among themselves and negatively with the practical status-oriented variables. The humanistic emphasis is unrelated to the group welfare emphasis and unrelated to rebelliousness. Apparently the strongly science-oriented environment is also characterized by non-conformity and independence. The status-oriented, practical environment has some positive relationship to rebellion but little or no relationship to group welfare. It is clearly anti-intellectual but not anti-knowledge. The college as a friendly, socializing, well-mannered environment is not anti-intellectual in general, but it is anti-scientific, anti-competitive, and anti-rebellious.

Later (1963a) Pace developed a "sequel" to the *College Characteristics Index* (CCI). He calls it *College and University Environment Scales* (CUES). Pace believes it to be a more sensitive and more refined instrument than the CCI. Brief summaries of the five CUES scales may be noted as follows:

> *Scale 1. Practicality*. This combination of items suggests a practical, instrumental emphasis in the college environment. Procedures, personal status, and practical benefits are important. Status is gained by knowing the right people, being in the right groups, and doing what is expected. . . . Good fun, school spirit, and student leadership in campus social activities are evident.
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> *Scale 2. Community*. The combination of items in this scale describes a friendly, cohesive, group-oriented campus. The environment is supportive and sympathetic. There is a feeling of group welfare and group loyalty which encompasses the college as a whole. The campus is a community. It has a congenial atmosphere.

> *Scale 3. Awareness*. The items on this scale seem to reflect a concern and emphasis upon the search for personal meaning, poetic (humanistic) meaning, and political meaning. . . . What seems to be evident in this sort of environment is a stress on awareness, an awareness of self, of society, and of esthetic stimuli.
>
> *Scale 4. Propriety*. The items in this scale suggest an environment that is polite and considerate. Caution and thoughtfulness are evident. Group standards of decorum are important. "The atmosphere on some campuses is more mannerly, considerate, and proper than it is on others."
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> *Scale 5. Scholarship*. The items in this scale describe an academic, scholarly environment. The emphasis is on competitively high academic achievement and a serious interest in scholarship. . . . Intellectual speculation, an interest in ideas as ideas, knowledge for its own sake, and intellectual discipline -- all these are characteristic of this environment.

Speaking to the Western Interstate Commission for Higher Education in 1960 Stern concludes the following about students in general:

> Students today seem interested in inter-personal behavior, the analysis of motivation, and the problems of dealing effectively and with decency in human relations. Any material placed in this context arouses a depth and intensity of response which belies the apathy and privatism encountered elsewhere. . . . Their values, in a socio-political sense, are perhaps less consistently conservative than considered heretofore. The predominant need is not so much for a new set of values, but for a new and different learning experience which provides them with the opportunity to discover the inadequacy of established expectancies and to explore new alternatives.

Regarding college and university environments, mmay of you will recall the gist of Edward Eddy's (1959) study reported in his volume, *The College Influence on Student Character*. The main point of the report is this: within the limits of their ability, college students in general will rise to the level of expectancy set for them by the faculty. Low expectations, low relative achievement; high expectations, high relative achievement. That too is worth remembering!

In an article a few years ago McConnell and Heist (1959) asked the question: "Do Students Make the College?" I emerged from reading this article not quite knowing whether the students make the college or the college makes the students! But the article makes quite clear the fact that certain types of students tend to gravitate to certain types of institutions of higher learning.

The authors (McConnell and Heist) report studies made at the Center for the Study of Higher Education at the University of California at Berkeley. They found that undergraduate students tend to find their own intellectual level and to seek education among their peers, despite differing degrees of internal variability in institutions. Knowing that National Merit Scholarship winners had attended America's most prestigious institutions "with frequences from 3 to 15 times greater" than expected, an investigation was launched to determine whether these institutions also attracted students with certain personaltiy characteristics. The researchers were concerned with personality traits related to intellectual disposition which varied among the students independent of aptitude scores. Scales for scoring included such characteristics as thinking introversion, originality, complexity of outlook, authoritarianism, theoretical interests or values, aesthetic interests or values, and religious interests or values. The Center found that members of both sexes who attended the most prestigious and productive institutions scored significantly higher on complexity of outlook and aesthetic values, but significantly lower on authoritarianism and religious values. Males scored significantly higher on the originality scale and females on the thinking introversion scales. The researchers concluded that predominant student traits and backgrounds may, in turn, produce a distinctive effect on collegiate communities.

Too little attention, according to McConnell (1962), has been paid to the distribution of students among institutions of a complex system (such as Georgia, for example) and educational programs in a complex institution (such as the University of Georgia, for example). As McConnell and Heist suggest (in Sanford, 1962a), the question "Who should go to college?" has now become in the light of research findings "Who should go where to college and for what purpose?"

Now let us turn briefly to research on peer-group influence and particularly to the work of Clark and Trow (Trow, 1960). Working (a) with students' involvement with ideas and (b) with their identification with their college, these investigators have identified four dominant student or peer subcultures on contemporary American campuses. Schematically, these peer subcultures may be shown as follows (Trow, 1960):

Involved with ideas

Identified with their college

|  | + | - |
|---|---|---|
| + | Academic | Collegiate |
| - | Non-conformist | Vocational |

Let us look at each of these subcultures. First, there is the collegiate subculture, which is primarily fun seeking and non-intellectual. This "free-wheeling" attitude toward college experience is typical of the large state university. Second, there is the vocational subculture which seeks education as a means to an end -- namely, upward social and economic mobility. It is typical, say Clark and Trow, of the large municipal community colleges. Third, there is the academic subculture, involving individuals who seek knowledge for its own sake and who have genuine intellectual interests. While the academic subculture is typical of the small, elite liberal arts college, there are elements of this culture on practically all campuses -- at least among the faculty if nowhere else! Fourth, there is the non-conformist subculture, through which its members seek some kind of personal identity. The relative number of such students on a given campus is generally small. While detached, rebellious, Bohemian students can probably be found on all campuses, they are more obvious, hence more typical, in the larger, more complex institutions -- especially in or near centers of heavy population.

A group of social scientists, as reported by Theodore Newcomb (1960), investigated three major factors affecting students while in college: (1) selection (emphasizing the importance of the characteristics, attitudes, abilities, and the like which students bring to college), (2) tutelage or faculty-administration influence, and (3) peer-group influence. The last named -- peer influence -- was found to have the greatest effect on attitudes. Newcomb suggests that the power and influence of peer groups could be used for intellectual and academic ends if intellectual and academic excitement were introduced in the common experience.

The Vassar studies also affirm the fundamental importance of the peer group in determining the course of events in college life (Bushnell in Sanford, 1962a). The typical Vassar girl feels it is far more important to be "in with the peer group" than to be "in with the faculty." This was one of the basic findings which emerged from the rather extensive studies of student culture and student characteristics at Vassar.

These Vassar studies, sponsored by the Mary Conover Mellon Foundation, also included follow-up studies of alumnae, even to comparing information of alumnae who had graduated as early as 1929 with those graduating as late as 1956. Though Vassar is known as a "rich girls'" college, actually students range from daughters of the extremely wealthy to girls on scholarships who also work part-time. Thus money assumes a relatively insignificant role in student life on campus. Students are highly selected both on scholastic achievement and the potential of contributing to campus life. I have previously commented on different aspects of these studies, so I will confine my discussion here to the alumnae studies.

Alumnae selected by random sampling three to four years after graduation indicated that values and attitudes with which one leaves college do not change appreciably in the early years after graduation. Further studies of alumnae (Freedman in Sanford, 1962a) from classes of 1904, 1914, 1921 to 1924, 1929 to 1935, and 1940 to 1943 indicate that these attitudes and values have considerable permanence.

Interviews with volunteer Vassar graduates of 1954-1956 and 1929 through 1935 revealed a lack of clarity of educational patterns among the younger when compared with the older alumnae. In earlier years girls exhibiting "Social and Peer-Group Orientation patterns" were not as good students as their modern counterparts. The Overachievers of times past -- those of no marked ability who made high grades by diligence and docility -- have merged with the Peer Group Oriented. Underachievers with Family Orientation of the early years have blended with High Achievers of the past, whose whole preoccupation was with intellectual or academic life. More dedicated students currently lead balanced lives and do not anticipate a single life. Seekers of identity in times past were so characterized because of discontinuities tied to social class origins; today this classification results from conflicts within the individual personality.

Interestingly, the "Family-Oriented-Underachievers" are most alert and alive intellectually twenty years after graduation. The Family-Oriented-Overachievers, the better students in a formal scholastic sense, have stagnated intellectually. And so for other educational patterns.

The complexity of relationships between later life and events of college years, so clearly pointed up by the Mellon Foundation studies at Vassar, leads Freedman to urge additional research in these areas. As he says, "Ideally, college experience must be viewed from a developmental point of view that encompasses the whole life span." Moreover, as Sanford points out, ". . . the human individual is all of a piece. He functions as a unit, and his diverse features develop in interaction one with another. Intelligence, feeling, emotion, action can be separated conceptually, but no one of them functions independently of the others. We (as academic people) know this from our experience (Sanford, 1962a)."

Reducing this information which I have summarized about research to an operational level, what does it all mean? In this complex of individually different students and different college environments, how can an institutional research practitioner deal with the findings of all this research? Well surely ". . . studies of student characteristics alone are not enough; we must look at student characteristics as they play upon and are changed by various characteristics in the college environment. The complex interaction between student and environment is the real focus of today's most promising research (Pace, 1960a)."

## Student Studies in Institutional Research: Practical Suggestions

So far this paper has been concerned with research relative to students: student characteristics, student cultures and sub-cultures, college environments, and relationships among these factors. These, it seems to me, are areas with which the institutional research worker must be familiar if he is effectively to carry out student studies in his own institution.

Now let us turn to the "bolts and nuts" of the institutional research task as it applies to student studies. In this area what does the institutional research worker do from day-to-day, week-to-week, month-to-month, year-to-year? I submit that this work concerning student studies falls into four categories:

1. Routine and repetitive data gathering: annual reports. Included in this category are student ability studies, grade point averages (by various groupings), grade distributions by school and department, faculty-student ratios, student progress, retention and attrition studies, student costs, in-migration and out-migration of students, and such other studies as the institutional research worker's imagination and situation deem necessary. The institutional research worker will do well to keep these data in a Fact Book for his own institution, one section of which is devoted to student studies. It will prove to be a useful document, especially if data are kept for several consecutive years thus making it possible to discern and analyze trends.

2. Discrete or "one-time" studies. In this category the institutional research worker is limited only by his imagination and the time and resources at his disposal. There is no limit to the number of discrete student studies which can be made. It is to be hoped that at least some of the research will be substantial and imaginative in character -- major contributions to knowledge concerning student characteristics, student cultures and subcultures, college environments and the like.

3. Periodic institutional self-studies. The regional accrediting agencies (in our instance, the Southern Association of Colleges and Schools) now require each member institution to make an institution-wide self-study at least once every ten years; and perhaps an intensive, comprehensive study at least once a decade is a good thing. It affords an opportunity for a college or university to stand back and look at itself as a whole. Involved will be administrators, faculty, non-academic personnel, and students -- the

entire academic community. And be assured that the institutional research agency will be deeply involved in the operation. Be assured also that student studies constitute a substantial part of the institution-wide self-study.

4. Use of standard inter-institutional measuring devices. Numbers of standard inter-institutional measuring devices are now available. Previously mentioned have been the College Characteristics Index (CCI) and College and University Environment Scales (CUES). Other instruments include the Activities Index (AI) and the College Student Questionnaires (CSQ).[1] Still other instruments -- many of them -- are available for other purposes. Institutional research workers ought to plan in their work schedules appropriate use of these measuring devices. Through the use of these instruments substantial contributions can be made to institutional self understanding.

## Conclusion

With regard to student studies, the context within which the institutional research worker operates was set forth in the closing paragraphs of T. R. McConnell's volume, A General Pattern for American Public Higher Education (1962):

> The ideal in a diversified system of higher education is to aid each student to find the institution, the curriculum, the student and faculty associations which will enable him to realize his potentialities most fully. But . . . our present stage of knowledge concerning the differences among students and differences within individuals, the requirements of the multitude of careers which are open to educated men, and the characteristics of college environments

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[1] The College Student Questionnaires (CSQ) were developed as a means of gathering a diversity of biographical and attitudinal information about college student bodies. . . . the questionnaires are likely to be of widest use in institutional self-study and planning. . . . CSQ Part 1 is designed for administration to entering students (freshmen, transfers) prior to the formal beginning of the academic year. . . . CSQ Part 2 is for administration toward the close of the academic year, usually in April or May. . . . (Selected excerpts from the Technical Manual, College Student Questionnaires, by Richard E. Peterson, Educational Testing Service, Princeton, New Jersey, pp. 1-2.)

and college subcultures will not permit us to attain this pairing with any degree of precision. Research on student characteristics and on the nature of college environments and of the interaction of the two in student development during the college years has scarcely begun. But behavioral scientists are now attacking these problems, bringing to bear upon them the methodologies and concepts of many related disciplines. We may expect in the next decade to learn far more about ways to stimulate desirable change in college students. Then and only then will we be able to guide them into appropriate educational opportunities with any degree of confidence.

Until we understand students more fully and have clearer ideas about the college experiences which will be most fruitful for them, many will make false starts and find it necessary to change directions. In some instances this may mean changing from one curriculum to another in the same institution. In a functionally differentiated system of public higher education in which some fields and levels of specialization are assigned to particular institutions, change of direction may mean transferring from one institution to another. Within the present limits of our knowledge about the "fit" between students and institutions, it would be indefensible, even in a coordinated and differentiated system, to assign a student once and for all to a particular institution or a specific curriculum. The system must be flexible enough to enable each student to reach the highest level for which his aptitude and performance qualify him.

From all that has been said in this paper it follows that in the area of student studies institutional research workers have plenty to do -- in fact, more than they can do! The major question is: "Where do we begin?"

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# ANALYZING FACULTY ACTIVITIES

John E. Stecklein
Bureau of Institutional Research
University of Minnesota

Knowledge of the work characteristics of college staff members is superficial in most institutions. Unfortunately our staff suffer from the general use of credit hours or class hours to express faculty load, and the resultant public image of the short-hour, easy-life work program of the college teacher. Although many college teachers work 48 to 58 hours per week, some for 11 months a year, we have not yet dispelled the common impression that the college professor works only 15 hours per week and has a three-month annual vacation.

What is even sadder, however, is the fact that too many of our college administrators do not have a concise picture of what their faculty members do, over and beyond the assigned credit-hour, instructional workload. Too often supervision of graduate advisees, committee assignments, and various public and professional services are loaded on faculty members already heavily burdened with classroom duties -- without realization of the heavy workload that these extra activities represent. Too often faculty members are assigned relatively light instructional loads because they are engaged in research, although the administrator has no clear picture of the nature of the research or evidence of research productivity. And too often this released time for research is spent on other types of professional activities, (e.g., editing journals, writing textbooks, etc.) instead of on research. It is important, therefore, for a conscientious administrator with the best interests of his institution at heart, to have readily available information about his faculty members' activities. Such information is not only essential to the administrator in making decisions concerning assignment of additional activities, the development of new programs, and the appropriate allocation of instructional or other responsibilities, but also to provide an overview of the functional emphasis of the institution as allocation of faculty time reflects this emphasis.

## Benefits to Faculty and Administrators

Many faculty members, on the other hand, believe that the reporting of workload information to the administration is solely for the benefit of the administration, and see no value in it for themselves. Quite to the contrary, it seems to me that the reporting of faculty activities on a consistent basis by individual faculty members, annually or biennially, might well be of more benefit to the faculty members, both individually and collectively, than it is to the administrators involved. Its value to the faculty member comes in many ways. Without the prod of a report requested by the administration concerning faculty activities, it is the rare faculty member indeed who sits down and thinks through his total work activity pattern, now and then, and attempts to determine where his work emphasis has been, why it has been there, and what changes he thinks should be made in this pattern. To be sure, we complain about the number of committee assignments that we have, or about the overload of student papers to be graded, or other peak load activities that make themselves prominent, but seldom do we stop to take quantitative, systematic account of the kinds of things we are doing.

One of my colleagues was recently motivated to compile the amount of time he had spent in his duties as chairman of an important university committee

He knew it was a lot of time, but he had never kept accurate account of the time involved. He was as amazed as anyone to discover that he had spent about 600 hours in five months -- on an activity that had been assumed on top of a full program. This meant that he had spent the equivalent of 15 forty-hour weeks on this overload activity. Needless to say, this revelation brought about a change in his work assignment. The first advantage to the faculty member then, is that a report form encourages him to pause and take stock of his activities.

The second way in which faculty load reports are of value to the faculty member is that by virtue of such information, deans and other administrators can make more equitable assignment of loads, committee appointments, and other responsibilities. It is true that the few faculty members who have been getting by with unreasonably light workloads, or who have been unproductive in the work assigned to them may have cause for concern. Nevertheless, we all recognize the need for increased effectiveness of use of our limited financial and faculty resources, and I do not believe that a thriving, growing institution can afford the luxury of faculty members who are not contributing their share to the most effective operation of the institution.

In a typical case an annual load report gives the faculty member an opportunity to tell the boss how he has spent his time during the past term and engenders increased confidence that his activities will be known and recognized. This benefit in effect, represents a correction of the situation I mentioned earlier, namely that the administrator too often does not know enough about how his faculty members spend their time and therefore, makes decisions concerning assignments, programs, etc., with inadequate information. Thus, the administrator profits from a better over-all understanding of the activities of his faculty and the individual faculty member profits both from the knowledge that there is this better understanding and from the confidence that accompanies this knowledge.

Although the major recent stimulus for collecting information about the faculty has usually not stemmed from the purposes I have just mentioned, these advantages still remain. The usual stimulus for such studies has been increased pressure upon top administrators, from boards of regents, legislators, or coordinating boards, for an increasing amount of evidence concerning the efficiency of operation of the institution. Thus most of the recent faculty load studies have been initiated for the purpose of budget making, cost analysis, or equalization of faculty service. Now, let us consider briefly the various kinds of faculty load measures that might be used.

## Kinds of Faculty Load Measures

Obviously, the kind of faculty load data that are collected will be determined by the purposes for which the data are needed. In the simplest instance, for example, if the administrator wants to know what the instructional workload of a faculty member is, this can be easily recorded in terms of the number of courses taught, the number of credit or class hours taught, the number of lectures or discussion groups or laboratories taught, or of the number of students, student-credit-hours, or student-class-hours taught. This kind of faculty load information has some utility and has for a long time represented the total picture of faculty activities in many institutions. The major drawback of such a technique is that it does not take into account the many time-consuming activities of faculty members, which may be both voluntary and involuntary, and which are quite separate from the instructional responsibilities. The faculty time devoted to these additional activities is important, not only from a faculty viewpoint, but also from the point of view of the costs of the various functions served by the institution. For example, in one college in a large university, a faculty load study showed that 38 per cent of full-time equivalent faculty time was devoted to instruction; in another college in the same university, 71 per cent of FTE faculty time was devoted to instruction. In still a third, 96 per cent of full-time equivalent faculty time was devoted to instruction. Obviously, taking the total salaries represented by all faculty in each of these three colleges, and considering that sum of money to represent the cost of instruction, would greatly distort the true cost of instruction in the first and second colleges, although it would be a reasonably accurate estimate of instructional cost (represented by staff time) in the third college. In other words, in the first two colleges, expenses incurred for faculty activities in such things as research, administration, counseling, public service, etc., would be classified as instructional costs in the absence of specific faculty information that enables the analyst to separate the proportions of faculty time devoted to these other functions.

In making analyses of faculty activities, we also find that there is a considerable difference in the amount of faculty time required to prepare for courses taught at the various levels and taught in various class sizes. Generally, the courses taught at the lower division level require less faculty time for preparation and evaluation than courses taught at the upper levels, and are therefore less costly. Similarly, small classes generally require less time outside of class per unit of class time than do large classes -- again resulting in lower cost per instructional unit. For example, one of our exploratory studies showed that in the arts college, graduate courses required about twice as much outside work (preparation, grading papers, etc.) for the teachers as the undergraduate courses. Similarly, at a given level, courses with more than 50 students required nearly twice as much outside work as classes with less than 15 students, and classes with 31-50 students required about 50 per cent more time. Exceptions occur here, of course, and one study that we made showed that full professors tended to spend much more time preparing for instruction at the lower division level than they did for seminars at the graduate level. On the other hand, assistant professors or associate professors who were teaching graduate courses tended to spend much more time preparing for their graduate seminars than did the full professors.

Much more knowledge is needed about the relationships between the amount of experience or ranks of individuals and the amount of load represented by the assignment of a course at a particular level. Conscientious faculty reports are essential to the acquisition of such knowledge.

## Collection of Data

The following set of questions should be considered carefully in designing a faculty load study:

1. Why is the study being made?
2. Who should be included?
3. What activities should be included?
4. How should the information be collected?
5. What time span should be involved?
6. How should the data be tabulated, summarized, and analyzed?
7. How will results be reported and to whom?
8. In what ways will the faculty load data be used?

Forms can be as complex and comprehensive as the investigator wishes. Sample forms used in previous studies are shown in Exhibits 1-4, representing different degrees of complexity and refinement; separate instruction forms, used in Exhibits 2 and 3, are not included. Each has its advantages and disadvantages as well as its special purposes. Generally speaking, it is probably unwise to ask faculty members to split their time into more than six

Exhibit 1

**Triplicate for Instructor**

## UNIVERSITY OF MINNESOTA
# FACULTY ACTIVITIES REPORT
### FALL QUARTER, 1950

The questions included in this schedule are designed to inventory the various services you rendered during the FALL QUARTER 1950, both directly to the University and to various groups and individuals, primarily because of your University connections. Please survey the entire blank before supplying any data to make certain that information is recorded in the appropriate spaces. **If items are omitted, it will be assumed that you are not engaged in the activities in question.** All estimates are to represent the time that you **personally** devote to the activity, and should not include the amount of time spent by colleagues or assistants who may also be participating in the activity. NOTE: Except for regular teaching which extends through an 11-week period, activities should be reported on a fall quarter payroll basis from **September 16 through December 15, 1950.** If more space is needed on any item or you wish to comment more explicitly, please retain item number and summarize information on additional sheets of paper.

**Name**________________ **Rank and Title**________________

**College**________________ **Dept. or Div.**________________

**Highest Earned Degrees**________________ **Term of Appointment and Per Cent of Time (e.g., B33*)**________________

* This indicates a B appointment (regular academic year) with 33 per cent of the individual's time allocated to University service. Specify both the type of appointment you now hold (A, B, C, E, or X) and the per cent of time covered by this appointment. If uncertain, please consult department or division office.

## I. TEACHING ACTIVITIES

**A. REGULAR DAYTIME CLASSES.** Please list courses taught by you on a group instructional basis (i.e., more than a single student) during fall quarter, 1950 and estimate time spent **by you personally** in class instruction and in preparation for class instruction. (NOTE: Individualized instruction, student counseling and advising are included elsewhere.)

| Item | Course Number | Section Number | Course Title† | Credit Hours† | Total Enrollment† (As of the Second Week of Classes) | Number of Clock Hours Fall Quarter Spent in | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Regular Classes‡ (Hours Per Week X 11) | | | | Preparation for Classes§ |
| | | | | | | Lecture or Discussion | Quiz Sections‖ | Lab., Studio or Field Work | Seminars | |
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| Total for regular classes fall quarter (sum for each column) | | | | | | | | | | |

† Report lecture, quiz, or other sections of the same class on separate lines, so that class enrollments can be accurately reported. Please do not duplicate credit hours.

‡ Clock hour for class meetings is defined as a regular 50-60 minute period.

‖ Do not report the laboratory or quiz hours of a course unless you personally spend this time with these groups. Time spent in counseling graduate students is to be reported later.

§ Include lecture preparation, preparation of mimeographed materials, examinations, syllabi, slides, charts or materials for demonstration, reading and grading of course examinations. Exclude general professional reading which is covered in Section V-C.

**B. NON-SCHEDULED AND INDIVIDUALIZED INSTRUCTIONAL ACTIVITIES FOR REGULAR STUDENTS.** Summarize in the spaces below non-scheduled conferences with individual students for instructional purposes excluding regular counseling and advisement (reported in Section II) or work included in A above.

1. Individual Oral Examinations (Fall Quarter, 1950)

| Type of Examination | Number of Examinations | Approximate Time Spent in Hours‖ |
|---|---|---|
| a. Honors examinations | | |
| b. M.A. examinations | | |
| c. Special professional examinations | | |
| d. Ph.D. examinations | | |
| Total (sum for each column) | | |

‖ Include time spent in preparation and reading of examinations or theses (not supervised by you) prior to the oral examination.

2. Supervision of Individual Reports, Theses, etc. (Fall, 1950)

| Type of Report | Number of Students Involved | Approximate Time Spent in Hours |
|---|---|---|
| a. Non-course undergraduate (Summa papers, etc.) | | |
| b. M.A. theses, colloquium papers, etc. | | |
| c. Ph.D. theses | | |
| d. Other graduate or professional reports | | |
| Total (sum for each column) | | |

3. Other Individual or Group Conferences with Students **Primarily for Instructional Purposes.** Please describe briefly and estimate the approximate number of hours devoted to this activity during fall quarter, 1950.

________________________________

________________________ **Time Estimate:** ______hours

**C. GENERAL EXTENSION CLASSES**

| Course Number | Abbreviated Course Title | Credit Hours | Number of Students in Class | No. of Clock Hours You Taught Fall Quarter |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |

**D. CORRESPONDENCE STUDY CLASSES**

| Course Number | Abbreviated Course Title | Credit Hours | Total No. of Lessons Submitted by Students During Fall Quarter |
|---|---|---|---|
| 1 | | | |
| 2 | | | |

3. Approximate total number of hours during fall quarter devoted to:

General Extension classes and their preparation. ______ hours

Correspondence study instruction. ______ hours

## II. COUNSELING AND ADVISING ACTIVITIES

A. Individual student counseling or advising on educational, vocational, or personal problems during fall quarter.

| Student Classification | Approximate Number of Students for Whom You Serve As: Major Adviser | Minor or Occasional Adviser |
|---|---|---|
| 1. Undergraduate students | | |
| a. Junior college students (your college) | | |
| b. Senior college students (your college) | | |
| c. Students from another college or division | | |
| 2. Unclassed or adult special students | | |
| 3. Graduate students | | |
| a. Candidates for M.A. | | |
| b. Candidates for some other Master's degree | | |
| c. Candidates for advanced professional degree | | |
| d. Candidates for Ph.D. degree | | |
| 4. Total students | | |

5. Approximate number of hours devoted to the above counseling and advising activities.

Undergraduate ______ hours. Unclassed ______ hours.

Graduate ______ hours. Total ______ hours.

B. Group Advising. Describe below any special assistance of this sort which you regularly provide for campus groups INCLUDING ADVISING OF STUDENT ORGANIZATIONS. Also please estimate the approximate time devoted to group advising during the fall quarter.

______

______

______

______

______ Time Estimate: ______ hours

C. Note any other WORK WITH INDIVIDUAL STUDENTS during fall quarter which occupied a significant part of your time. (Incompletes from previous quarters, placement, interviewing prospective students, correspondence, etc.) Also please estimate the approximate time devoted to this work with individual students.

______

______

______

______

Time Estimate: Undergraduate ______ hours. Graduate ______ hours

## III. RESEARCH AND WRITING ACTIVITIES

A. Describe briefly the individual or group research projects in which you have personally participated during the fall quarter. If more than five projects are involved, insert an additional sheet to provide the necessary information. Do not include here graduate theses that you are supervising, the hours for which are to be reported under Section I-B.

| Descriptive Title of Project | Project Sponsorship (Please Describe, e.g., None (self); contract research; state, federal, or Graduate School Support, etc.) | Approximate No. of Hours During Fall Quarter Devoted to This Project (Include Preparation of Reports) | Workers Assisting with Project: Number of Separate Persons | Full-Time Equivalent Total |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| Total devoted to research activities | | | | |

B. Describe below any writing which you have done fall quarter exclusive of materials for classes reported in Section I.

1. Research Reports (not included above) ______

______

______

2. Textbooks ______

______

______

(OVER)

3. Editorial work ____________________

4. Other articles, reviews, bulletins, books ____________________

C. Estimate the total number of hours during fall quarter devoted to writing activities reported in this section: ______ hours

## IV. ADMINISTRATIVE AND GENERAL OFFICE RESPONSIBILITIES

A. If your job carries definite administrative responsibilities, please check (√) any of the phrases below that indicate the nature of your duties. Add others not given here.

1-3. Administrative and supervisory officer for:
- ____ 1. an instructional unit (college, department, or div.)
- ____ 2. a non-instructional research unit
- ____ 3. a non-instructional service unit

____ 4. Budget preparation
____ 5. Payrolls, supplies, equipment
____ 6. Preparation of catalog copy
____ 7. Staff conferences or staff improvement activities
____ 8. Public relations
____ 9. Administrative correspondence or conferences concerning appointments, promotions, etc.
____ 10. Preparation of reports to administrative offices
____ 11. Student placement
____ 12. Coordination with other units
____ 13. Others (____________________)

B. Please check (√) any of the following office responsibilities which you perform personally:

____ 1. Dictation of correspondence, reports, etc.
____ 2. Establishment and maintenance of office files
____ 3. Clerical, statistical, or stenographic work for self
____ 4. Scheduling appointments, conferences, etc.
____ 5. Preparation of business forms, routine reports, etc.
____ 6. Development and/or admin. of departmental exams.
____ 7. Planning curriculum
____ 8. Others. Please specify ____________________

C. Do you have assistance (academic or clerical) in discharging responsibilities:

Check (√) One

1. Checked in A above? Some ( ) Little ( ) None ( )
2. Checked in B above? Some ( ) Little ( ) None ( )

D. Approximate time during fall quarter (exclusive of time credited elsewhere in this report) which you personally devoted to:

1. Administrative responsibilities (A above) ______ hours    2. General office responsibilities (B above) ______ hours

## V. PROFESSIONAL READING, STUDY, AND ORGANIZATIONAL ACTIVITIES

A. Professional Organizations and Societies: Membership and Attendance at Meetings

1. In the table below please indicate professional memberships and attendance at meetings during fall quarter.

| Name of Professional Organization or Society | Type of Organization |  |  | Offices Held (List) | Participation in Meetings (Use code below*) |
|---|---|---|---|---|---|
|  | Local | State or Regional | National |  |  |
| a. |  |  |  |  |  |
| b. |  |  |  |  |  |
| c. |  |  |  |  |  |
| d. |  |  |  |  |  |
| e. |  |  |  |  |  |

* Code for participation: 1. General meeting attendance and discussion, 2. Led panel discussion, 3. Presented paper or formal speech, 4. Planned program, 5. Other (Please indicate.)

2. Estimate the total number of hours you have devoted to work for professional organizations or meetings during fall quarter (exclusive of travel time, which should be reported in Section VII-E). ______ hours

B. Further Professional Study

1. List below the numbers and titles of any courses taken during fall quarter.

| Department and Course Number* | Title of Course | Credit Hours Completed |
|---|---|---|
|  |  |  |
|  |  |  |
|  |  |  |

* Mark with an asterisk the numbers of courses taken as part of the requirements for an advanced degree.

2. Estimate the number of hours which you have spent fall quarter in completing these courses.
A. Class attendance ______ hours. b. Participation ______ hours. Total ______ hours.

C. Estimate the total number of hours during fall quarter, 1950 devoted to general professional reading and study (exclusive of hours reported elsewhere in this report). ______ hours

## VI. OTHER CAMPUS ACTIVITIES

A. Membership on campus committees during the fall quarter.

| Name of Committee | Type of Committee Check (√) One | | | No. of Meetings Attended | Offices Held, Fall Quarter |
|---|---|---|---|---|---|
| | Dept. | All-Coll. | Univ. | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

B. Attendance at staff meetings during the fall quarter.

| Name of Staff Meeting | Type of Meeting Check (√) One | | | No. of Meetings Attended |
|---|---|---|---|---|
| | Dept. | College | Other | |
| | | | | |
| | | | | |
| | | | | |

C. Other Campus Service Activities (not otherwise reported). Please describe briefly.

D. Approximate time during the fall quarter devoted to campus service activities listed under Section VI ........................ ________hours

## VII. NON-CAMPUS SERVICE ACTIVITIES

A. Advisory and Consultative Services. Please indicate the nature and type of advisory or consultative assistance rendered on a regular basis under continuing contacts with private industry, government, and professional agencies.

| Type of Activity | Types of Organization | | | | | Nature of Your Participation | Approximate No. of Hrs. Fall Quarter Devoted to This Activity |
|---|---|---|---|---|---|---|---|
| | Check (√) One | | Check (√) One | | | | |
| | Private | Governmental | Local | State or Regional | National | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

B. Other advisory services, largely to individuals seeking specialized help through telephone inquiries, office calls, and correspondence. Describe briefly the nature of this assistance.

C. Speaking engagements during the fall quarter (exclusive of professional papers listed under Section V-A).

| Name of Organization | Subject of Talk | Place (i.e., city) |
|---|---|---|
| | | |
| | | |
| | | |

D. Approximate time during the fall quarter devoted to non-campus service activities listed in B and C above ........................ ________hours

E. Approximate time during the fall quarter devoted to transportation to and from meetings in connection with **all off-campus service and professional activities.** ........................ ________hours

Exhibit 2

**CALIFORNIA AND WESTERN CONFERENCE COST AND STATISTICAL STUDY**

**FORM L-2: INDIVIDUAL WORK ANALYSIS, 1954-1955**

INSTITUTION: ______________ ☐ CAMPUS: ______________ ☐ INDIVIDUAL'S NAME: ______________ RANK: ______________ ☐

COLLEGE OR SCHOOL ______________ ☐ DEPARTMENT ______________ ☐ ADMINISTRATOR'S SIGNATURE: ______________

## A. TEACHING WORK ANALYSIS

| FIRST SEMESTER OR FALL QUARTER | | | | | | | SECOND SEMESTER OR WINTER QUARTER | | | | | | | SPRING QUARTER | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPT. | COURSE NUMBER | TYPE OF INSTR. | SECTIONS | NO. OF STUDENTS | LEVEL OF INSTR. | % OF FULL-TIME | DEPT. | COURSE NUMBER | TYPE OF INSTR. | SECTIONS | NO. OF STUDENTS | LEVEL OF INSTR. | % OF FULL-TIME | DEPT. | COURSE NUMBER | TYPE OF INSTR. | SECTIONS | NO. OF STUDENTS | LEVEL OF INSTR. | % OF FULL-TIME |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | | | | | | | | | | | | | | | | | | | | |
| TEACHING TIME SUB-TOTAL | | | | | | | TEACHING TIME SUB-TOTAL | | | | | | | TEACHING TIME SUB-TOTAL | | | | | | |

## B. NON-TEACHING WORK ANALYSIS

| LINE NO. | DESCRIPTION | SUBJECT FIELD, SERVICE, OR RELATED ACCOUNT IN WHICH THE WORK WAS PERFORMED | | PERCENTAGE OF FULL-TIME | | |
|---|---|---|---|---|---|---|
| | | CODE NUMBER | STANDARD ABBREVIATION | 1ST SEM. OR FALL QTR. | 2ND SEM. OR WINTER QTR. | SPRING QUARTER |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | TEACHING TIME SUB-TOTAL | | | | | |
| 2 | DEPARTMENTAL RESEARCH | | | | | |
| 3 | DEPARTMENTAL ADMINISTRATION | | | | | |
| 4 | PUBLIC & PROFESSIONAL SERVICES | 7600 | PROF. SERV | | | |
| 5 | ORGANIZED ACTIVITIES RELATED TO INSTRUCTIONAL DEPTS | 73 . . . | | | | |
| 6 | Organized & Sponsored Research | 74 . . . | | | | |
| 7 | LIBRARY | 7500 | LIBRARY | | | |
| 8 | PUBLIC SERVICE & INFORMATION | 76 . . | | | | |
| 9 | EXTENSION | 7700 | EXTENSION | | | |
| 10 | AGRICULTURAL EXTENSION | 7800 | AG. EXTENSION | | | |
| 11 | GENERAL ADMINISTRATION | 81 . . . | | | | |
| 12 | STUDENT SERVICES | 82 . . . | | | | |
| 13 | STAFF BENEFITS | 83 . . | | | | |
| 14 | Gen. Institutional Services & Expense | 84 . . . | | | | |
| 15 | Physical Plant Operation & Maint. | 85 . . | | | | |
| 16 | AUXILIARY ENTERPRISES | 8600 | AUX. ENTER. | | | |
| 17 | STUDENT AID | 8700 | STUDENT AID | | | |
| 18 | | | | | | |
| 19 | | | | | | |
| 20 | TOTAL PERCENTAGE OF FULL-TIME | | | | | |

## C. ACTUAL SALARY EXPENDITURES

| LINE NO. | STANDARD CLASSIFICATION OF SUBJECT FIELDS, SERVICES, AND RELATED ACCOUNTS | | SALARY EXPENDITURES | | |
|---|---|---|---|---|---|
| | TITLE | CODE | ACAD. YEAR | SUMMER | TOTAL |
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | INSTRUCTIONAL DEPARTMENTS | | | | |
| 2 | (a) | | | | |
| 3 | (b) | | | | |
| 4 | (c) | | | | |
| 5 | ORGANIZED ACTIVITIES RELATED TO INSTRUCTIONAL DEPARTMENTS | 73 . . | | | |
| 6 | ORGANIZED & SPONSORED RESEARCH | 74 . . | | | |
| 7 | LIBRARY | 7500 | | | |
| 8 | PUBLIC SERVICE & INFORMATION | 76 | | | |
| 9 | AGRICULTURAL EXTENSION | 7800 | | | |
| 10 | GENERAL ADMINISTRATION | 81 . . | | | |
| 11 | STUDENT SERVICES | 82 . . . | | | |
| 12 | STAFF BENEFITS | 83 . . | | | |
| 13 | Gen. Institutional Services & Expense | 84 . . | | | |
| 14 | PHYSICAL PLANT OPERATION & MAINT. | 85 . . . | | | |
| 15 | AUXILIARY ENTERPRISES | 8600 | | | |
| 16 | STUDENT AID | 8700 | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | TOTAL INSTITUTION SALARY | | | | |

1. ______________ 2. ______________ 3. ______________

| FILE NO. | NAME | COLLEGE | DEPARTMENT | PER CENT OF FULL TIME ASSIGNED TO SERVICE IN THIS DEPARTMENT |
|---|---|---|---|---|
| | | | | |

Exhibit 3

←(Please detach and read instructions before completing)

# WAYNE STATE UNIVERSITY
## FACULTY SERVICE REPORT
## Spring Semester, 1960-61

1. DIRECT INSTRUCTIONAL RESPONSIBILITIES IN DEPARTMENT NAMED ABOVE

| (1) DEPARTMENT OR SUBJECT AREA | (2) COURSE NUMBER | (3) SECTION NUMBER | (4) CREDIT HOURS | (5) CONTACT HOURS PER WEEK | (6) PER CENT OF SERVICE TO DEPARTMENT NAMED ABOVE | (7) FOR COLLEGE USE |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

2. OTHER SERVICE TO DEPARTMENT NAMED ABOVE

| | | |
|---|---|---|
| (a) DEPARTMENTAL OR COLLEGE ADMINISTRATION | (a) | |
| (b) RESEARCH IN YOUR PROFESSIONAL FIELD | (b) | |
| (c) WRITING AND OTHER SCHOLARLY ACTIVITIES IN YOUR FIELD | (c) | |
| (d) DEPARTMENT, COLLEGE, AND UNIVERSITY COMMITTEES AND COUNCILS | (d) | |
| (e) COUNSELLING | | |
| (1) PER CENT UNDERGRADUATE | (e.1) | |
| (2) PER CENT GRADUATE OR GRADUATE-PROFESSIONAL | (e.2) | |
| (f) CURRICULUM RESEARCH AND PLANNING | | |
| (1) PER CENT UNDERGRADUATE | (f.1) | |
| (2) PER CENT GRADUATE OR GRADUATE-PROFESSIONAL | (f.2) | |
| (g) PUBLIC SERVICE | (g) | |
| (h) OTHER (SPECIFY) ______________________ ______________________ | (h) | |
| TOTAL OF PER CENTS IN ITEMS 1 AND 2 MUST EQUAL | 100% | |

Signatures of: ______________________ ______________________

FACULTY MEMBER DEPARTMENT CHAIRMAN (OR DEAN)

Questions should be directed to your department chairman (or dean) or to Robert Hubbard, Extension 591. Please return both copies of the completed form to your dean's office by April 3, 1961.

## Exhibit 4

*Please read "Instructions and Definitions" prior to completing the form.*

**FOR YOUR FILE**

**ACADEMIC STAFF TIME UTILIZATION STUDY**
**FIRST SEMESTER OR QUARTER 1965-66**

Date Completed: ______________________

### SECTION A: GENERAL

A. Rank and/or Title:
(1) ______ Professor
(2) ______ Associate Professor
(3) ______ Assistant Professor
(4) ______ Instructor
(5) ______ Teaching or Faculty Assistant
(6) ______ Research Associate
(7) ______ Research Assistant
(8) ______ Project Associate
(9) ______ Project Assistant
(10) ______ Other (Please specify) ______________________

B. Highest Academic Degree Held: (1) ______ Bachelor's; (2) ______ Master's; (3) ______ Specialist; (4) ______ Doctor's;
(5) Other (Please specify) ______________________.

C. Were you on leave without pay from the institution during the semester or quarter? ........ Yes ______; No ______.

D. Are all of your salary checks issued by a source other than the institution with which you are associated? ........ Yes ______; No ______.

E. Does your appointment with the institutional system extend for less than the entire semester or quarter? Yes ______; No ______.

*If the answer to any one of questions C, D, or E is "Yes", return the questionnaire without completing the remaining questions.*

F. Is your appointment in more than one department of the institution? ........ Yes ______; No ______.

G. In what department of the institution is your *major* appointment? ........ ______________________.

H. Are you employed by the institution: full-time __________; part-time __________?

If part-time, what per cent does your first semester or quarter employment bear to full-time employment for that semester or quarter? ______%.

Do NOT Write in Box

| Employee No. | | | | | | Sex | Comp. | | Div. | | Major Dept or Activity | | | | Rank or Title | | Deg | Appt | % F.T. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |

### SECTION B: DISTRIBUTION OF TIME

Where called for in the following, please report to the nearest hour the average number of hours devoted to the indicated activity in an average or typical work week during the 1965-66 fall semester or fall quarter. *Exclude hours of work for extra pay in addition to regular institutional appointment, and duties and hours for which pay is not received from the institution.* If item under "Ave. Hours Per Week" is not applicable, place a dash (–) above the blank.

Ave. Hours Per Week

*1. Are you now teaching any Organized (group) Instruction courses? ........ Yes ______; No ______.
If yes, report average hours per week devoted to:
1.1 Direct In-Classroom Teaching ........ ______ 23
*1.2 Preparation and Associated Activities ........ ______ 25
1.3 Conferring with Students (enrolled in your courses) about that course work ........ ______ 27

2. Are you instructing students individually in formal or informal situations? ........ Yes ______; No ______.
If yes, report average hours per week devoted to:
*2.1 Individual Work (other than extension) ........ ______ 29
2.2 Individual Instruction (in extension credit and non-credit courses – such as correspondence study) ........ ______ 31

3. Do you advise individual students in regard to their total academic program? Yes ______; No ______.
If yes, report average hours per week devoted to such advising ........ ______ 33

SUB-TOTAL OF ABOVE ACTIVITIES (1 + 2 + 3) ........ (______) 35

4. Estimated per cent of the "Sub-Total" of items 1, 2, and 3 devoted to each of the following types of students:
4.1 Freshman–Sophomore Students ........ ______ % 37
*4.2 Junior, Senior, Special, and Adult Credit Students ........ ______ % 39
4.3 Graduate Students ........ ______ % 41
4.4 Law or Medical Students ........ ______ % 43
4.5 Non-Credit Extension Students ........ ______ % 45

TOTAL PER CENT = 100 %

**If an item is asterisked, please refer to the "Instructions and Definitions" sheet for the item with the same number.*

(OVER)

**Ave. Hours Per Week**

*5. Are you engaged in Student Service or Library functions? ................ Yes ______; No ______.
If yes, report average hours per week devoted to these services ................................ ______ 47

6. Do you perform any departmental, school or college, or overall campus or institutional level administrative functions? .......................... Yes ______; No ______.
If yes, report average hours per week devoted to:
*6.1 Departmental level administration ................................................ ______ 49
*6.2 School or College level administration.
Allot total hours at School or College level between:
*6.21 Budget, facility planning, recruiting staff, etc. ................................ ______ 51
*6.22 Academic program development, teaching assignments, etc. ............................ ______ 53
*6.3 Campus or Institutional level administration ................................................ ______ 55

7. As a part of your regular institutional duties, are you engaged in scholarly, professional, or administrative research? .............................. Yes ______; No ______.
If yes, report average hours per week devoted to:
*7.1 Departmental research ................................................ ______ 57
*7.2 Budgeted research ................................................ ______ 59

*8. As a part of your regular institutional duties, are you engaged in Adult Education and Public Service activities? .............................. Yes ______; No ______.
If yes, report average hours per week devoted to these activities ................................ ______ 61

*9. As a part of your regular institutional duties, are you engaged in Auxiliary Enterprises? ................................................ Yes ______; No ______.
If yes, report average hours per week devoted to such activities ................................ ______ 63

*10. Do you engage in Other Scholarly Activities? Yes ______; No ______.
If yes, report average hours per week devoted to such activities ................................ ______ 65

11. Are you engaged in any university activities which can not be included in any of items 1 through 3 and 5 through 10? .............................. Yes ______; No ______.
If yes, please specify and give average hours per week

______________________________________________

______________________________________________

______________________________________________ ......................... ______ 67

TOTAL OF ALL ACTIVITIES (Items 1 through 3 plus 5 through 11) ......................... (______) 69

Signature: ______________________________ ______________________________
Reporting Staff Member — Department Head, Director, or other appropriate Faculty or Administrative Officer

or eight major categories, because the process of allocation becomes too difficult. The kind of information desired, and the mode of collecting such information will, of course, determine the nature of the form to be used.

In my opinion, the simplest and most direct way of collecting overall faculty load data is to ask each faculty member to allocate his total work time on the basis of percentages. In other words, a full-time employee would allocate his 100 per cent time among such activities as teaching, administration, research, counseling, etc., according to his best estimate of how he spent his time during the specified term. No assumption would be made about the standard work-week or the equating of labs and lectures. He would simply consider all his activities and consider them within the framework of 100 per cent time. Obviously no one could exceed 100 per cent unless he had another paying job.

It is also important to know what each faculty member's load is in terms of amount of time spent, but this information can be obtained in a general estimate for a specified time period. In other words, each faculty member could be asked to report an estimate of the average number of hours he actually worked per week during the particular period being studied. Thus, he might allocate his 100 per cent time among his several activities and then indicate that he estimates that on the average he worked about 50 hours per week that semester. With this information, the percentage figures can be used to reproduce the number of hours spent on particular activities for an average week, if there is interest in such figures.

I prefer this approach to the additive process because our studies indicate that spuriously high average work weeks are obtained by the latter procedure. For example, in one such study we found average work weeks of 58 to 59 hours per week and ranging as high as 120 hours. I believe that there is a natural tendency for people to over-estimate time spent on infrequent activities that may take only 15 minutes or a half hour at a time, and that when these over-estimates are accumulated, one ends up with an average work week that is spuriously high. A second reason for my preferring the percentage approach to the hourly approach is that it is usually more time-consuming and more difficult for faculty members to identify and isolate the number of hours spent on particular activities over a semester or quarter than it is for them to make a gross estimate of percentage breakdowns. Although at first I shared a rather general skepticism of the ability of faculty members to make accurate percentage estimates of their time, after much study and involvement with the several methods of recording time spent, I have come to the conclusion that faculty members can do an extraordinarily good job of estimating their time allocation. After all, most faculty members have to develop a sort of built-in time clock to pace themselves in their teaching and other duties, so the process is not new to them.

I should mention, I believe, that many people are afraid of collecting faculty load information because they believe it will result in a standard or a formula being established. I believe it is unwise to establish a standard work-week or to attempt to set faculty loads by formula. Our activities are so complex and variable that it is impossible to set up any simple formula and even complex formulas cannot take into account individual differences in work habits, the effects of experience, or different attitudes toward teaching. However, we must recognize the fact that other groups such as legislators and regents often do think in terms of standards. It is useful, therefore, for administrators to have figures such as average work-weeks for faculty. Such averages can be used as points of reference in making faculty assignments, but they should not be used as a mold for every faculty member -- variation in loads should be expected and even planned. Faculty load reports without restrictive standards can be useful, therefore, in identifying levels and areas of maximum and minimum activity, as well as functional emphases for the faculty as a whole. The administrator should then be able to combine such information with other information about faculty activities, such as the number of committee assignments, publications, number of advisees, research output, etc., to interpret the figures.

## Kinds of Data Available from a Faculty Load Study

Some of the kinds of data available from an analysis of faculty activities are shown in Tables 1 - 5. Thorough discussion of these tables requires more space than is available here, but comments about a few highlights of these tables will serve to indicate the kinds of interpretation that can be made of such data. It should be stressed that data from a faculty load study do not provide answers -- data merely point to areas that should be looked at more closely, raise questions, or provide quantitative measures useful in supporting or refuting preconceptions or claims. The data are intended to help administrators make decisions.

Table 1 shows one way of presenting data to illustrate the functional emphasis reflected by the use of faculty time. The data show the percentages of time devoted by faculty members in the various ranks to teaching, research, administration, public and professional services, and student services. Additional detail is provided by breakdown of research into departmental research and organized and sponsored research and separate listing for departmental and general administrative activities.

These data represent the activities of faculty in a liberal arts college. Looking across in the first row under "Professor," the table indicates that only two per cent of the full professors did no teaching during the year under study. In contrast, 25 per cent spent no time on departmental research, 90.5

## TABLE 1

## NUMBER AND PER CENT OF FULL-TIME ACADEMIC STAFF MEMBERS IN LIBERAL ARTS COLLEGE DEVOTING SPECIFIED PROPORTIONS OF TIME TO VARIOUS FUNCTIONS, ARRANGED ACCORDING TO RANK

| Rank and Per | Teaching | | Dept. Research | | Org. & Spons. Research | | Total Research | | Dept. Admin. | | General Admin. | | Pub. & Prof. Services | | Student Services | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cent of Time | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Professor | | | | | | | | | | | | | | | | |
| 0% | 2 | 2.4 | 21 | 25.0 | 76 | 90.5 | 15 | 17.8 | 14 | 16.7 | 50 | 59.5 | 12 | 14.3 | 42 | 50.0 |
| 1-5% | 0 | - | 13 | 15.5 | 0 | - | 12 | 14.3 | 33 | 39.3 | 26 | 31.0 | 39 | 46.4 | 27 | 32.2 |
| 6-10% | 3 | 3.6 | 14 | 16.7 | 0 | - | 13 | 15.5 | 10 | 11.9 | 5 | 5.9 | 23 | 27.4 | 8 | 9.5 |
| 11-20% | 3 | 3.6 | 15 | 17.8 | 0 | - | 15 | 17.8 | 7 | 8.3 | 2 | 2.4 | 9 | 10.7 | 6 | 7.1 |
| 21-49% | 31 | 36.9 | 17 | 20.2 | 5 | 5.9 | 22 | 26.3 | 13 | 15.5 | 0 | - | 1 | 1.2 | 0 | - |
| 50-79% | 34 | 40.4 | 4 | 4.8 | 3 | 3.6 | 7 | 8.3 | 7 | 8.3 | 0 | - | 0 | - | 1 | 1.2 |
| 80-100% | 11 | 13.1 | 0 | - | 0 | - | 0 | - | 0 | - | 1 | 1.2 | 0 | - | 0 | - |
| Total | 84 | 100.0 | 84 | 100.0 | 84 | 100.0 | 84 | 100.0 | 84 | 100.0 | 84 | 100.0 | 84 | 100.0 | 84 | 100.0 |
| Assoc. Prof. | | | | | | | | | | | | | | | | |
| 0% | 1 | 1.4 | 17 | 23.0 | 69 | 93.3 | 12 | 16.2 | 20 | 27.0 | 62 | 83.7 | 22 | 29.7 | 28 | 37.8 |
| 1-5% | 0 | - | 16 | 21.6 | 0 | - | 16 | 21.6 | 31 | 41.9 | 10 | 13.5 | 36 | 48.9 | 28 | 37.8 |
| 6-10% | 0 | - | 7 | 9.5 | 0 | - | 7 | 9.5 | 10 | 13.5 | 1 | 1.4 | 11 | 14.9 | 17 | 23.0 |
| 11-20% | 0 | - | 17 | 23.0 | 0 | - | 17 | 23.0 | 6 | 8.1 | 1 | 1.4 | 5 | 6.7 | 0 | - |
| 21-49% | 15 | 20.3 | 14 | 18.9 | 0 | - | 14 | 18.9 | 4 | 5.4 | 0 | - | 0 | - | 1 | 1.4 |
| 50-79% | 37 | 50.0 | 3 | 4.0 | 5 | 6.7 | 8 | 10.8 | 3 | 4.1 | 0 | - | 0 | - | 0 | - |
| 80-100% | 21 | 28.3 | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | - | - |
| Total | 74 | 100.0 | 74 | 100.0 | 74 | 100.0 | 74 | 100.0 | 74 | 100.0 | 74 | 100.0 | 74 | 100.0 | 74 | 100.0 |
| Ass't. Prof. | | | | | | | | | | | | | | | | |
| 0% | 1 | 1.5 | 27 | 40.9 | 62 | 94.0 | 23 | 34.8 | 27 | 40.9 | 64 | 97.0 | 35 | 53.0 | 23 | 34.9 |
| 1-5% | 0 | - | 3 | 4.6 | 0 | - | 3 | 4.6 | 20 | 30.3 | 2 | 3.0 | 23 | 34.9 | 24 | 36.4 |
| 6-10% | 0 | - | 8 | 12.1 | 0 | - | 8 | 12.1 | 14 | 21.2 | 0 | - | 5 | 7.6 | 14 | 21.2 |
| 11-20% | 0 | - | 11 | 16.7 | 1 | 1.5 | 12 | 18.2 | 2 | 3.0 | 0 | - | 3 | 4.5 | 4 | 6.0 |
| 21-49% | 5 | 7.6 | 17 | 25.7 | 1 | 1.5 | 18 | 27.3 | 3 | 4.6 | 0 | - | 0 | - | 0 | - |
| 50-79% | 34 | 51.5 | 0 | - | 2 | 3.0 | 2 | 3.0 | 0 | - | 0 | - | 0 | - | 1 | 1.5 |
| 80-100% | 26 | 39.4 | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - | 0 | - |
| Total | 66 | 100.0 | 66 | 100.0 | 66 | 100.0 | 66 | 100.0 | 66 | 100.0 | 66 | 100.0 | 66 | 100.0 | 66 | 100.0 |

TABLE 1--Continued

| Rank and Per Cent of Time | Teaching | | Dept. Research | | Org. & Spons. Research | | Total Research | | Dept. Admin. | | General Admin. | | Pub. & Prof. Services | | Student Services | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| Instructor | | | | | | | | | | | | | | | | |
| 0% | 0 | - | 40 | 71.4 | 54 | 96.4 | 38 | 67.8 | 40 | 71.4 | 53 | 94.6 | 35 | 62.5 | 26 | 46.4 |
| 1-5% | 0 | - | 2 | 3.6 | 0 | - | 2 | 3.6 | 13 | 23.2 | 1 | 1.8 | 17 | 30.3 | 23 | 41.1 |
| 6-10% | 1 | 1.8 | 4 | 7.1 | 0 | - | 4 | 7.1 | 2 | 3.6 | 1 | 1.8 | 3 | 5.4 | 5 | 8.9 |
| 11-20% | 3 | 5.4 | 2 | 3.6 | 0 | - | 2 | 3.6 | 1 | 1.8 | 0 | - | 0 | - | 1 | 1.8 |
| 21-49% | 9 | 16.1 | 8 | 14.3 | 0 | - | 8 | 14.3 | 0 | - | 0 | - | 1 | 1.8 | 1 | 1.8 |
| 50-79% | 10 | 17.8 | 0 | - | 2 | 3.6 | 2 | 3.6 | 0 | - | 0 | - | 0 | - | 0 | - |
| 80-100% | 33 | 58.9 | 0 | - | 0 | - | 0 | - | 0 | - | 1 | 1.8 | 0 | - | 0 | - |
| Total | 56 | 100.0 | 56 | 100.0 | 56 | 100.0 | 56 | 100.0 | 56 | 100.0 | 56 | 100.0 | 56 | 100.0 | 56 | 100.0 |
| All Ranks | | | | | | | | | | | | | | | | |
| 0% | 4 | 1.4 | 105 | 37.5 | 261 | 93.2 | 88 | 31.4 | 101 | 36.1 | 229 | 81.8 | 104 | 37.2 | 119 | 42.6 |
| 1-5% | 0 | - | 34 | 12.1 | 0 | - | 33 | 11.8 | 97 | 34.6 | 39 | 13.9 | 115 | 41.0 | 102 | 36.4 |
| 6-10% | 4 | 1.4 | 33 | 11.8 | 0 | - | 32 | 11.4 | 36 | 12.8 | 7 | 2.5 | 42 | 15.0 | 44 | 15.7 |
| 11-20% | 6 | 2.2 | 45 | 16.1 | 1 | .4 | 46 | 16.4 | 16 | 5.7 | 3 | 1.1 | 17 | 6.1 | 11 | 3.9 |
| 21-49% | 60 | 21.4 | 56 | 20.0 | 6 | 2.1 | 62 | 22.2 | 20 | 7.2 | 0 | - | 2 | .7 | 2 | .7 |
| 50-79% | 115 | 41.1 | 7 | 2.5 | 12 | 4.3 | 19 | 6.8 | 10 | 3.6 | 0 | - | 0 | - | 2 | .7 |
| 80-100% | 91 | 32.5 | 0 | - | 0 | - | 0 | - | 0 | - | 2 | .7 | 0 | - | 0 | - |
| Total | 280 | 100.0 | 280 | 100.0 | 280 | 100.0 | 280 | 100.0 | 280 | 100.0 | 280 | 100.0 | 280 | 100.0 | 280 | 100.0 |

per cent spent no time on organized or sponsored research, and 59.5 per cent spent no time on general administration. At the other end of the percentage distribution, the table shows that 53.5 per cent (40.4 + 13.1) of the full professors spent 50 per cent or more of their time on teaching and only 8.3 per cent spent half or more of their time on research. In comparison, the first column of figures under the heading "Associate Professor" shows that 78.3 per cent of the associate professors spent 50 or more per cent of their time on teaching and farther down the same column the reading is 90.9 per cent of the assistant professors who devoted half or more of their time to teaching. The small amount of participation of the associate professors and the assistant professors in general administration of the university is reflected by the 83.7 per cent of the associate professors and 97.0 per cent of the assistant professors who spent no time at all on general administrative duties. This category includes reported participation on committees, as well as other kinds of more formal administrative duties.

It is commonly known that different colleges have different functional emphases. The data presented in Table 2 show in striking comparison the ways in which these functions are reflected by the use of academic staff time. Looking at the utilization of the professors' time alone, the table shows clearly that college A, at least in terms of professorial emphasis, is the college that promotes teaching and public and professional service, because a comparatively large proportion of the full professors (56.6) spent 50 per cent or more of their time on teaching, a large proportion (69.7 per cent) spent five per cent or less time on research, and another large proportion (52.2 per cent) spent more than 10 per cent of their time on public and professional services. In comparison, college B professors show a research and public and professional service emphasis, with a small proportion spending

## TABLE 2

## A COMPARATIVE DISTRIBUTION OF FACULTY TIME IN 3 COLLEGES IN A UNIVERSITY

| Rank | Teaching 50% or more Time | | | Research 5% or less Time | | | Public & Prof. Serv. More than 10% Time | | |
|---|---|---|---|---|---|---|---|---|---|
| | College A | College B | College C | College A | College B | College C | College A | College B | College C |
| Professor | 56.6 | 11.5 | 53.5 | 69.7 | 13.1 | 32.1 | 52.2 | 45.9 | 11.9 |
| Assoc. Professor | 57.2 | 19.5 | 78.3 | 64.3 | 17.0 | 37.8 | 42.8 | 51.2 | 6.7 |
| Asst. Professor | 54.6 | 31.0 | 90.0 | 63.7 | 40.4 | 39.4 | 27.3 | 26.2 | 4.5 |
| Instructor | 50.0 | 37.4 | 76.7 | 93.7 | [illegible]3.2 | 71.4 | 12.5 | 9.4 | 1.8 |
| Total | 54.7 | 22.7 | 73.6 | 73.5 | 27.8 | 43.2 | 36.0 | 35.8 | 6.8 |

half or more of their time teaching, a small proportion doing very little research, and a large proportion spending a comparatively large amount of time on public and professional services. The third college, college C, reflects a teaching and research emphasis, with very little time spent on public and professional services. The same kinds of emphases carry fairly well throughout all ranks in this three college comparison.

The kinds of basic data that can be tabulated from a comprehensive faculty load study, data which can be used not only for careful comparison of the kinds of teaching output in relation to the amount of faculty effort involved, but which are essential to the development of a unit cost analysis, are presented in Table 3. From this table the reader can easily see that 16 courses were offered in Oriental Languages at the lower division level, which had 234 course enrollments. The amount of money required, in terms of teaching salary expenditure only, to offer these 16 courses was $14,111; in the far right-hand column, the full-time equivalent teaching staff involved in teaching the 16 courses is shown as 2.20. In comparison, the Physics Department offered 8 lower division courses to 4,192 course enrollments at a teaching salary expenditure of $67,229, utilizing 19.31 full-time equivalent teaching staff. The data for the Psychology Department show that four courses were taught to 2,511 course enrollments (slightly more than half of the number taught in the physics courses), with a teaching salary expenditure of $32,988 (slightly less than half of the expenditure for the physics courses) and 8.86 full-time equivalent teaching staff (again less than half of the number used in the physics courses). It is apparent from these figures that the salary level and the level of the faculty used in teaching the courses will in part determine the unit cost figures that will be derived from such basic data.

Some of the kinds of unit measures that can be derived from faculty load data are shown in Table 4. Such measures, like the basic data shown earlier,

## TABLE 3

## BASIC DATA, LOWER DIVISION

| Department | Number of Courses | Number of Course Enrollments | Course Credit Hours | Student Credit Hours | Total Class Hours | Student Class Hours | Teaching Salary Expenditure | F.T.E. Teaching Staff |
|---|---|---|---|---|---|---|---|---|
| 1027 Oriental Lang. | 16 | 234 | 51 | 766 | 66 | 766 | 14111 | 2.20 |
| 1029 Philosophy | 6 | 3391 | 24 | 10173 | 223 | 10160 | 39074 | 10.08 |
| 1030 Phys. Educ. | 5 | 6360 | 10 | 3332 | 717 | 14106 | 80334 | 15.06 |
| 1031 Physics | 8 | 4192 | 45 | 12533 | 562 | 18867 | 67229 | 19.31 |
| 1032 Polit. Sci. | 2 | 1589 | 12 | 4767 | 188 | 6356 | 42046 | 12.18 |
| 1033 Psychology | 4 | 2511 | 24 | 7533 | 128 | 10049 | 32988 | 8.86 |
| 1035 Scandinavian | 6 | 41 | 24 | 164 | 24 | 164 | 2231 | .41 |
| 1037 Sociology | 3 | 462 | 9 | 1386 | 38 | 1386 | 7252 | 2.05 |
| 1038 Span. & Portug. | 15 | 1605 | 71 | 6027 | 387 | 7158 | 52408 | 14.95 |
| 1039 Speech | 9 | 3202 | 63 | 9841 | 403 | 9944 | 59837 | 11.54 |
| 1040 Zoology | 4 | 1666 | 22 | 5525 | 288 | 9894 | 28763 | 8.26 |

## TABLE 4

## UNIT MEASURES, LOWER DIVISION

| Department | Teaching Salary Expenditure | | | Student Credit Hours Per F.T.E. Staff | Class Hours Per F.T.E. Staff | Student Class Hours Per F.T.E. Staff | Mean Class Size | | |
|---|---|---|---|---|---|---|---|---|---|
| | Per Student-Credit-Hour | Per Student-Class-Hour | Per F.T.E. Staff | | | | Non Lab. | Lab. | Total |
| 1027 Oriental Lang. | 18.42 | 18.42 | 6414 | 348 | 30 | 348 | 12 | 7 | 12 |
| 1029 Philosophy | 3.84 | 3.85 | 3876 | 1009 | 22 | 1008 | 46 | | 46 |
| 1030 Phys. Educ. | 24.11 | 5.70 | 5334 | 221 | 48 | 937 | 21 | 20 | 20 |
| 1031 Physics | 5.36 | 3.56 | 3481 | 649 | 29 | 977 | 98 | 17 | 34 |
| 1032 Polit. Sci. | 8.82 | 6.62 | 3452 | 391 | 15 | 522 | 34 | | 34 |
| 1033 Psychology | 4.38 | 3.28 | 3723 | 850 | 14 | 1134 | 94 | 17 | 79 |
| 1035 Scandinavian | 13.73 | 13.73 | 5490 | 400 | 59 | 400 | 7 | | 7 |
| 1037 Sociology | 5.23 | 5.23 | 3537 | 676 | 19 | 676 | 36 | | 36 |
| 1038 Span. & Portug. | 8.70 | 7.32 | 3505 | 403 | 26 | 478 | 18 | | 18 |
| 1039 Speech | 6.08 | 6.02 | 5185 | 853 | 35 | 862 | 25 | | 25 |
| 1040 Zoology | 5.21 | 2.91 | 3482 | 669 | 35 | 1198 | 310 | 22 | 34 |

can be obtained for lower division, upper division, total undergraduate, graduate, and total undergraduate and graduate categories, if such detail is desired. The first three columns show what the unit cost measures look like if only teaching salary expenditures are considered. In Oriental Languages, for example, the cost was $18.42 for each student credit hour taught, or $6,414 for each full-time equivalent staff member involved.

Looking farther over in that same row, some of the causal factors of the costs are shown in the 348 student credit hours taught per full-time equivalent faculty member and the size of the class, where the mean size of these classes was 12. For comparison, the cost of teaching each student credit hour in physical education at the lower division level was $24.11, with a teaching salary expenditure per full-time equivalent staff of $5,334. The average class size was 20 and the number of student credit hours taught per full-time equivalent staff was 221. In physics, the cost was much lower per student credit hour ($5.36), which reflects the lower teaching salary expenditure per full-time equivalent staff ($3,481). As you would expect, the number of student credit hours taught per full-time equivalent staff was much higher in physics (649) than in the other two subjects and the average class size was 34, well above that of the other subjects. A fourth subject in the listing -- psychology -- was even less expensive than the other three ($4.38 per student credit hour). This low cost was due partly to the lower teaching salary expenditure per full-time equivalent staff ($3,723) but more specifically because of the large number of student credit hours produced per full-time equivalent staff (850) and the very large average class size (79). If total departmental expenditures are desired, data can also be collected concerning the expenditures for equipment, supplies, and secretarial and other assistance, and added to the teaching salary expenditures, to develop

## TABLE 5

### DISTRIBUTION OF TOTAL FULL-TIME-EQUIVALENT STAFF WORKING IN AND/OR PAID BY INSTRUCTIONAL DEPARTMENTS, COLLEGES, AND SCHOOLS, AMONG TEACHING AND NON-TEACHING FUNCTIONS AND AMONG ACADEMIC RANKS

| | Professor | | | Associate Professor | | | Assistant Professor | | | Instructor | | | Teaching Assistant | | | All Ranks | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | F.T.E | Per Cent Of Total | | F.T.E | Per Cent Of Total | | F.T.E | Per Cent Of Total | | F.T.E | Per Cent Of Total | | F.T.E | Per Cent Of Total | | F.T.E | Per Cent Of Total | |
| Functions | | In Rank | In Function | | In Rank | In Function | | In Rank | In Function | | In Rank | In Function | | In Rank | In Function | | In Rank | In Function |
| Teaching | 174 | 19.3 | 43.8 | 146 | 16.3 | 51.6 | 179 | 19.9 | 56.6 | 101 | 11.3 | 66.2 | 300 | 33.3 | 98.3 | 901 | 100.0 | 61.8 |
| Departmental Research | 95 | 36.3 | 24.0 | 62 | 23.6 | 21.8 | 72 | 27.6 | 22.9 | 30 | 11.5 | 19.8 | 2 | .9 | .8 | 263 | 100.0 | 18.0 |
| Departmental Admin. | 52 | 54.0 | 13.1 | 24 | 25.1 | 8.5 | 16 | 17.4 | 5.3 | 2 | 2.9 | 1.8 | | .5 | .2 | 96 | 100.0 | 6.6 |
| Public & Professional Ser. | 21 | 45.6 | 5.3 | 10 | 22.7 | 3.7 | 12 | 26.3 | 3.9 | 2 | 4.9 | 1.5 | | .2 | | 46 | 100.0 | 3.2 |
| Organized & Sponsored Res | 23 | 27.1 | 6.0 | 24 | 28.1 | 8.7 | 24 | 28.2 | 7.8 | 12 | 14.5 | 8.3 | 1 | 1.9 | .6 | 88 | 100.0 | 6.1 |
| Organized Activities | 3 | 36.1 | .8 | 1 | 14.5 | .4 | 1 | 15.7 | .4 | 2 | 28.9 | 1.6 | | 2.4 | .1 | 8 | 100.0 | .6 |
| Institutional Admin. | 15 | 67.5 | 3.9 | 5 | 22.5 | 1.8 | 2 | 9.1 | .7 | | .4 | .1 | | | | 23 | 100.0 | 1.6 |
| University Counseling | | 22.2 | .1 | | 44.4 | .1 | | 11.1 | | | 11.1 | .1 | | | | | 100.0 | .1 |
| All Other Functions | 12 | 40.3 | 31.1 | 9 | 29.7 | 3.2 | 7 | 25.4 | 2.4 | 1 | 3.3 | .7 | | .7 | .1 | 30 | 100.0 | 2.1 |
| Total | 398 | 27.3 | 100.0 | 284 | 19.5 | 100.0 | 317 | 21.8 | 100.0 | 153 | 10.5 | 100.0 | 305 | 100.0 | 100.0 | 1459 | 100.0 | 100.0 |

unit measures showing total expenditures in relation to the various units of output.

Table 5 shows another way of obtaining an overview of the total functional emphasis of a college or department, by rank, or for all ranks combined. This table also shows how faculty load data can provide a picture of the relative allocation of faculty time at the various ranks for a given function. In the latter instance for example, looking at row one, the data show that, of total faculty time devoted to teaching, 19.3 per cent was time spent by full professors, 16.3 per cent was time spent by associate professors, 19.9 per cent was time spent by assistant professors, 11.3 per cent by instructors and 33.3 per cent by teaching assistants, in this particular college.

The data in the column headed "In Function" provide a picture of the functional emphasis of staff time spent at each rank or by each rank group. For example, of all time spent by the 398 full-time equivalent professors, 43.8 per cent of the time was spent on teaching, 24.0 per cent spent on departmental research, and 13.1 per cent on departmental administration, etc. These data, then, provide another overview of how a faculty, as a group, spent its time, in a form different from that shown in Table 1.

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# STUDIES IN COLLEGE ADMISSION

Cameron Fincher
Institute of Higher Education
University of Georgia

The difficulties of gaining admission to the college of one's choice have received a great deal of public attention in recent years. The nation's rising birth rate in the early years of World War II and the "baby boom" in the postwar years, coupled with a rapidly growing general demand for higher education, have produced no little alarm that high school graduates will be unable to enter the college of their first choice. The reason has been an increasing reliance on selective admission policies and practices for an increasing number of the nation's institutions of higher education. Parents hoping that their sons and daughters would attend college at the parent's alma mater have frequently found that their children were in intense competition with thousands of other applicants for a relatively few seats in the freshman class. For example, according to the Stanford Observer over 8,000 applicants are seeking admission to Stanford University in the Fall of 1967; the number of freshmen that will be admitted is 1,300, giving a ratio of over six applicants to one admitted freshman.

In the Fall of 1961 the number of entering freshmen in the nation's colleges exceeded one million for the first time; in the Fall of 1964--the year in which the first crop of postwar babies entered college--the number of entering freshmen increased by almost one quarter of a million. Projections for the future indicate that by 1975 we will have two million freshman entering college the Fall Quarter. Total college enrollment in 1975 is projected to be almost nine million--meaning simply that two out of every nine college students in 1975 will be freshmen just entering college (Projections of Educational Statistics to 1974-75, 1965).

The purpose of this paper is not to review the innumerable studies that have been conducted in the area of college admission but rather to discuss some of the problems involved in college admissions and to give something of an overview of studies in admission as one form of institutional research.

## The Admissions Process

Frank Bowles (1963) has defined the admissions process as "the series of selections to which students are subjected by their country's educational system through the entire period in which they mature to the age of entrance to higher education." Admission to college, in his opinion, is a process which encompasses all the events in an individual's life that influence his entrance into an institution of higher education. Many of these events are planned and are formal; others, of course, are entirely fortuitous.

From the viewpoint of institutions of higher education, the admissions process begins when a prospective student makes inquiry concerning admission to that institution and requests, perhaps, a catalog and an application blank. The various requirements for admission to the nation's numerous institutions are the outcome of over two hundred years of trial and error on the part of the nation's oldest colleges. Broome (1963), in his historical review of admission requirements, states that the first formally stated admission requirements were the ability to read and to write Latin and the ability to read Greek. As other colleges and universities were established for purposes other than envisioned by our colonial ancestors, different requirements were established. It is of interest, however, that anything approaching uniform requirements in English were not established until the close of the 19th century. Broome concluded from his review that the most important problem involved in admission to college was the need for closer articulation between the high schools and the colleges. He decried the efforts of high schools to play a dual role of preparing students for college while at the same time trying to prepare for immediate employment upon graduation. For those unfamiliar with Broome's work, his book was first published in 1903 and was reprinted by the College Entrance Examination Board in 1963. Broome also made the statement that "Educational principles and practices are undergoing a revolution."

Despite the contemporary ring of Broome's criticisms and recommendations, it is nonetheless true that college admission has become a far more complex, time consuming process. Application blanks have become more extensive, testing is an inherent part of the process for almost all colleges, high school transcripts are submitted and evaluated more systematically (increasingly by computers in the larger universities). Playing a much smaller role are letters of recommendation from ministers, physicians, and other public leaders. Also diminishing in importance are recommendations from high school principals and---except in the case of athletic scholarships---recommendations from influential alumni.

The increasing complexity of the admissions process is quickly sensed by a brief perusal of college catalogs. The number of pages given to discussion of admission requirements and the detailed description of procedures is ample proof that admission to college is an involved process. As Hauser and Lazarsfeld (1964) have shown, the admissions process is increasingly directed by a specialist for whom admissions work is his major or sole responsibility. Indeed, admissions work is of such a magnitude that seven percent of the subjects in the Hauser and Lazarsfeld study held the title, "Dean of Admissions."

## Current Problems In Admissions

Although there has been a rapid specialization of admissions work since World War II, it would be a mistake to infer that the problems of admissions are common to all colleges and universities. The variety of institutions of higher education in the nation and the diversity of students entering those institutions insure that no single admissions program will serve every institution.

Yet, there is something of a tendency to perceive selective admissions as one means of coping with the problems of large numbers of students. Some colleges are committed to maintaining current levels of enrollment and are seeking better prepared students with the expectation that the over-all quality of the college will be improved. Other colleges are willing to increase enrollments but are limited by physical facilities and financial resources. Still others---such as the large state universities---are required to expand enrollments but must, out of necessity, establish some kind of selective admissions program.

The efforts of many states to develop a system of junior colleges is a definite means of facilitating "access" to higher education, but it does not imply that all junior colleges will have open-door policies. If we may judge by the prevailing tendencies in education, many junior colleges will move as quickly as possible to establish selective criteria.

## Purposes and Goals

Many of the problems in college admissions stem from conflicting views of the purposes and goals of higher education. Many college administrators rightly reject an institutional role as "custodian" and others argue cogently that no benefit accrues to a student who is admitted even though there is good evidence that he will be excluded for failure to maintain academic standards. Yet, one of the major problems in college admissions is the extent to which the institution will be selective in admitting students. To use two terms borrowed from communication theory by Cronbach and Gleser (1965), we could say that the problem is one of striking the right balance between bandwidth and fidelity. The nation's colleges and universities must admit students who will meet degree requirements while at the same time keeping the door open enough to serve the diverse objectives of students, society, and state.

## Global Versus Analytic Assessment

Confronted with the necessity of selecting students, the problem then becomes one of deciding how to assess the qualifications of the applicants. The question of what to assess is not as irrelevant as it would first appear. Hauser and Lazarsfeld's study reveals that the majority of admission officers believe their most important function to be one of selecting students who will contribute most to the institution and to reduce drop-outs and failures. Yet, it is interesting to note that the majority of admission officers do not combine test scores and grades to make a statistical prediction of college performance; only 13 percent of the group reported a firm minimum predicted average grade below which an applicant is automatically rejected.

On the other hand, 12 percent of the admission officers regarded a personal interview as the single most important factor in the decision to admit or to reject. Another 51 percent reported the personal interview to be an important factor while only 29 percent regarded the personal interview as an unimportant factor. These findings strongly suggest that the assessment of applicants for college is still, for the most part, a global assessment and not an analytic one. We may further suspect that most admission policies are still couched in glowing generalities and that the actual factors determining choice of students are seldom articulated in specific, behaviorial terms.

## Match-making Between Students and Colleges

In discussing the diverse student population of the nation's numerous colleges and universities, McConnell and Heist (1962) pose the problem of whether there should be greater effort to fit the student to the college. They report the tremendous range in academic ability found among the typical entering freshman at various institutions and give an example of six four-year liberal arts colleges. No student in two highly selective colleges scored as low as the typical freshman in one college; in another college no student scored as high as the typical freshman in the two selective colleges. In yet another college the entering freshmen scored throughout almost the entire range of possible scores.

The data reported by McConnell and Heist lend support to the belief that, in so far as academic ability is concerned, there is a college somewhere for every high school graduate. This notion is further supported by John Hills' finding (Hills, Bush, and Klock, 1965) that, with effort, any (Georgia) high school graduate would be able to gain admission to some public college in Georgia. Of 2,185 applicants rejected by at least one public college in 1963, 43 percent were able to gain admission elsewhere. Undoubtedly the percentage is not higher due to the fact that only 20 of the remaining 1,245 students had bothered to apply to a college other than the one that rejected them. None of the 1,245 students applied to as many as three colleges.

The data presented by McConnell and Heist and those presented by John Hills imply that while many students may be rejected by the college of their first choice because of low scores on an academic ability test, their actual failure to enroll in some college must be attributed to something other than low academic ability

## Implicit Values

Not the least of the factors affecting both a student's decision to attend college and his choice of a college is what we might call his system of values. It is obvious that students enter college for a diversity of reasons, but despite the many efforts to study student motives, goals, and needs, the implicit values held by applicants is one of the major problems in college admissions work.

If, as Hauser and Lazarsfeld indicate, the admissions officers perceive their role as one in which they are expected to reduce drop-outs and failures, there would seem to be ample reason to understand better the values held by students. One may well postulate, with justification, that the majority of students who leave college without completing degree requirements do so for reasons other than a lack of academic ability. This is undoubtedly related to the finding that admissions officers place such a high premium on personal interviews. One suspects that most admissions officers judge with relative ease from test scores and high school records the applicant's ability to maintain academic standards at the college level but feel that a personal interview gives them better insight into the student's goals, attitudes, beliefs, and opinions.

How well admissions officers can assess from a personal interview an applicant's motives and values is a question needing a great deal of empirical research. There is an abundance of evidence testifying to the unreliability of personal interviews, but this does not disprove that some admissions officers may be quite astute in understanding an applicant's reasons for attending a particular college. The important point here is the need for a distinction between the reasons, goals, and attitudes that the student or applicant verbalizes and the implicit values he holds. That students cannot or will not articulate certain values is the problem confronting the admissions officer.

## The Traditional Approach in College Admissions

There has been for the past three decades, an effort on the part of many colleges to select students on the basis of predicted performance. Yet, when we look at the criterion chosen as an index of academic performance, we must recognize that too many colleges have chosen a criterion of pragmatic value to the institution but one of limited value to society and nation. The criterion chosen is one of the more interesting creations of educators' imagination; it's commonly called a grade-point-average.

The intent in averaging of grades is honest and admirable, but the manner in which the averaging of grades has become the predominant criterion of academic success is questionable. Skimming the catalogs of our numerous colleges and universities, we are led easily to the conclusion that institutions of higher education have seized tenaciously upon the grade-point-average as the fairest--translate to read "democratic"--means of deciding academic survival or failure. Few college catalogs fail to specify a certain grade-point-average that the student must maintain. If he does not, he is placed on probation for the next quarter or semester. During his probation period the student is required to make some specified grade-point-average for that particular period. If he does not, he is academically excluded or dismissed from the institution--usually for one quarter or semester with the right to petition for re-entry at the beginning of the following quarter or semester.

Just why the grade-point-average should be the sole criterion of educational achievement in so many colleges has never been made explicit, but few college administrators and faculty members seem to question the practice of averaging grades in such diverse courses as English, science, mathematics, history, music, and art--each is properly weighted, of course, by the number of credit hours assigned to the course. If a farmer judged the value of his livestock by averaging the weight of his hogs, cows, and horses, there would be some question as to his sanity.

## Measured Characteristics

The acceptance of the grade-point-average as a criterion of academic performance has been accompanied by extensive efforts to measure characteristics of the student which would enable college admission officers to predict student performance. Because several studies of the Army Alpha developed during World War I indicated an appreciable relationship between Army Alpha scores and college grades, the search for predictor variables began on a grand scale. The efforts to develop standardized tests were spurred further by later studies that indicated that the Army Alpha was actually not suitable for selected populations such as college students. During the 1920's the American Council on Education Psychological Examination for College Freshmen (ACE), the College Entrance Examination Board Scholastic Aptitude Test (SAT), and the Ohio State Psychological Examination (OSPE) were developed, tried, applied, and sometimes deified.

What the tests actually measured was debated for some years in the professional journals, much of the debate hinging on definitions and too often being caught in the quagmire of the heredity versus environment issue. What the tests actually accomplished in the way of facilitating access to higher education is still a subject for research. But once accepted by educators and the general public, the tests acquired a sanctity of their own. College presidents viewed with pride the rise in average scores made by entering freshmen, and even high school principals, who at first feared that the tests would be used to evaluate their schools, began the boast of the high scores made by their graduating seniors. Despite the incessant cautions of test constructors and distributors, there was widespread belief for many years that if a student scored high on a given test, he was ipso facto "college material."

## Efforts to Correlate

Because of the ease with which test scores could be correlated with grade-point-averages, the validity of academic ability tests was generally accepted as the extent to which they correlated with college grades. As computational devices were improved, making the computation of correlation coefficients even easier, the correlation of test scores and college grades became the leitmotif of many a master's thesis and doctoral dissertation. Regression equations were developed that would enable college admission officers to predict the grade-point-averages of entering freshmen, and despite Hauser and Lazarsfeld's finding that most admission officers still do not make use of such equations, there were nonetheless some admission officers who knew a golden key when they saw one.

By 1934 enough studies of academic prediction had been conducted that Segel (1934), in reviewing the literature, could report a typical range of correlation coefficients from .35 to .54. In 1946 Crawford and Burnham reported that correlations between college grades and test scores typically ranged from .40 to .50, and in 1961 Bloom and Peters, reviewing the problems of academic prediction, concluded that despite vast improvements in testing techniques, the correlation of test scores with college grades was still within the range reported by Segel 27 years earlier.

## Sources of Variation in Academic Performance

If we ask why standardized tests of academic ability do not correlate higher with college grades than the correlation coefficients so frequently reported, we must recognize that whatever psychological skills and abilities the tests measure, they cannot account for the extensive variation observed in student performance. Accepting a coefficient of .50 as representative and computing a coefficient of determination by squaring the correlation coefficient, we find that whatever the test measures accounts for only 25 percent of the variance in the criterion. That is to say, three-fourths of the observed variation in grades is still to be accounted for.

If we seek the sources of variation in student performance, we can immediately designate two major sources: (1) the many individual differences that exist among our diverse student populations, and (2) the many differences in grading standards that exist among the various colleges, departments of instruction, and college faculty members in the nation. A closer examination of the sources of variation may well suggest that the proper question is why do standardized tests of academic ability correlate as well with academic grades as they do--not why do they not correlate higher.

## Individual Differences

McConnell and Heist (1962) have demonstrated best the tremendous variation in academic ability found in the nation's student population. But not only have they demonstrated the variation in scholastic aptitude, they have also emphasized the individual differences found in a host of what they call "nonintellective characteristics." These include innumerable personality characteristics that are subtly tied to academic performance. Among these characteristics are the implicit values of the students--referred to previously--their interests, attitudes, beliefs, opinions, sociocultural backgrounds, study skills and habits, modes of adaptation or accommodation, and innumerable personality traits.

Especially relevant here are the objectives the student pursues in attending college and the expectations he has for successful achievement of these objectives. Someone has glibly said that students attend college for as many reasons as there are students, but it would be better not to begin with the assumption that there are over 5 million reasons for going to college. Morris Stein (1963), after reviewing a decade of studies inquiring into the role of personality measures in college admissions, concluded that students may be described in terms of three major systems: (1) a system of drives, (2) an internalized system of rewards and punishments, and (3) a system of adaptive mechanisms. Each student, according to Stein, has his own pattern of factors in these three systems. Studies in college admissions suffer from a tendency to concentrate on a single predictor variable and to ignore the many other variables in play.

## Grading Standards

Differences in grading standards as a source of variation in student performance have received spasmodic attention from educational research workers. The thought occasionally occurs to a research worker that the manner in which college instructors assign grades is highly capricious, and occasionally the research worker can throw some light on the subject before he learns that he is tampering with "academic freedom."

In a recent doctoral dissertation, Thomas McDonald (1966) found considerable variation in grading policies among departments with courses at the freshman level. With the exception of the English department, all departments placed a major emphasis on scheduled quizzes and final examinations in assigning grades but considered, in varying degrees, at least eleven other factors for grading purposes.

When individual faculty members were queried as to grading standards, the great majority of them responded that they held to an absolute grading standard as opposed to a relative one. McDonald concluded from his study that the rationale for assigning grades was a definite function of subject content among the various departments and of individual preferences among faculty members. He also found from a survey of student perceptions that students possessed a more accurate knowledge of faculty grading patterns than the faculty itself did.

## Efforts to Achieve Higher Predictive Efficiency

The desire for better prediction of college grades has led to a number of strenuous efforts to improve prediction efficiency. This has meant that many colleges have sought means of accounting for the unaccounted-for variance in academic performance, and that they have resorted to an amazing number of different ways of doing so. How successful each of the methods have been is still too much a matter of preference--not empirical research!

### Multiple Correlation Techniques

One of the first--and the most obvious--methods of improving predictive efficiency is the combination of two or more predictor variables in a multiple regression equation, with each appropriately weighted. Again, despite the fact that a majority of Hauser and Lazarsfeld's admission officers did not combine high school averages and academic ability scores to make a statistical prediction of college grades, there are some advantages in doing so. As John Hills (1964) has shown, the differential weighting of high school averages and SAT scores result in a typical multiple correlation of .65--a correlation coefficient significantly improved over the so-frequently reported coefficient of .50 for high school grades or academic ability scores alone.

While Hills' data amply demonstrate the advantages of multiple correlation techniques, there must be recognition that there are also disadvantages. The use of a multiple regression equation implies compensatory effects which are sometimes logical and sometimes not (Fincher, 1965). The major weight in such equations usually goes to the high school averages, and the question actually becomes one of how much can the addition of scholastic aptitude test scores improve the predictability of college grades over and beyond the use of high school grades. An unpublished study by this writer, using Hills' data, indicates that the improvement, in general, is slight and may not be worth the effort.

## Multiple Selection Criteria

Efforts to improve predictive efficiency through multiple selection criteria have been extensive but seldom formalized. This has confused the effectiveness of two different methods, and no attempt shall be made here to debate the comparative utility of the two methods.

Under multiple selection criteria, an applicant is expected to meet not one criterion, or several combined in a multiple regression equation, but rather jointly two or more criteria. In other words, the applicant is expected to present both a high school average above a certain level and academic scores above a certain level. Failure to meet both criteria results in a decision to reject the applicant.

The application of multiple criteria may be more frequent than the application of multiple correlation techniques. On the one hand, this method appears more logical to many persons while, on the other, it denies both compensatory efforts and differential weighting, penalizing certain individual applicants who would, in fact, succeed if admitted.

## Purification of High School Records

There have been numerous attempts to improve predictive efficiency by modifying or adjusting the high school record on which applicants are assessed. The most frequently used method is that of computing a high school average with the exclusion of "non-academic" course grades--that is to say, by eliminating such course grades as recorded for home economics, agriculture, shop-work, physical education, and driver training.

Yet, John Hills and his staff (Hills, Bush, and Klock, 1965) have examined the problem with five different types of public colleges and concluded that the improvement in predictive efficiency is not worth the clerical effort involved. According to Hills' findings, it makes little difference whether a college purges nonacademic courses or merely computes a high school average based on all courses taken.

Another method of purifying high school records is one of adjusting high school records according to the level of academic ability found among typical graduates. This method has been suggested by various testing experts from time to time and is presented in cogent form most recently by Bloom and Peters (1961). The arguments for adjusting high school grades in terms of the quality of the high school are persuasive, to say the least, but there is good reason to believe that the argument applies only when studying the general relationship between high school grades and college grades--a matter in which few colleges appear to be interested. The argument loses much of its ardor when no less an authority than E. F. Lindquist (1963) concludes that if high school grades and standardized tests are used in conjunction, no adjustment of high school grades is worthwhile. It appears that no college or university attracts students randomly from the nation's secondary schools, and that the differential weighting of test scores and high school averages in a regression equation is, in itself, an adjustment of high school records.

## Purification of College Grades

A method less frequently discussed but nonetheless designed to improve predictive efficiency is the modification of the college grade-point-average. This method takes various forms but, in essence, restricts the prediction of grades to subject matter areas that have a greater degree of communality with high school courses. One possible approach in this area is to identify a modal curriculum and then to attempt prediction of the individual's grade-point-average on the basis of _if_ he took specific courses in a specified sequence. This approach to improving predictive efficiency deserves more attention than it has been given in the past.

### Use of Non-intellectual Predictors

Over the past decade there has been a rash of doctoral dissertations in which there has been an intensive search for non-intellectual, non-cognitive, or motivational predictors of academic success at the college level. These studies range from a strictly empirical approach--if it correlates, it's useful--to a few fairly sophisticated theoretical approaches.

Much of the effort in this area has been directed to the search for measures of an elusive quality commonly know as "motivation." The oftstated cliche that, "We will never be able to predict college success until we can measure motivation" has been accepted as a challenge by many candidates for the doctorate. Some have turned up promising leads, but unfortunately, these leads have not withstood the tough-minded requirements of cross-validation. Some wit has said that enthusiastic researchers and doctoral candidates always get positive results, but--like most grains of truth--this does not explain fully why so many promising findings "wash out" when cross-validated on different groups of students in different colleges. The difficulty is more likely due to the lack of adequate theoretical rationale and the plowing up of spurious or chance relationships.

Within the past few years there has been a flurry of activity in the area of measuring student characteristics and student perceptions of the college environment. These studies are the outcome of innumerable references to the importance of "college climates" and student expectations. The intent, needless to say, is to find a systematic way of identifying characteristics of the student which can be matched with their perceptions of college characteristics.

Educational Testing Services has recently initiated a program for institutional research whereby Pace's College and University Environment Scales (CUES) and Peters' College Student Questionnaires (CSQ) are available for general use.

A considerable amount of interesting data has been mined with the CUES and its predecessor, the College Characteristics Index (CCI). Other interesting promises have been shown by the CSQ, but no convincing evidence is available as to uses of either type of inventory in aiding the decisions of college admissions. Better promise is shown by the work of John Holland and his staff (Richards, Holland, and Lutz, 1966) in which there has been an effort to go beyond the prediction of undergraduate grades and to study variables related to postgraduate achievement and to non-academic accomplishment in college.

## Central Prediction Models

Lastly, some attention should be given to what has been called central prediction models. As Bashaw (1965b) has stated, a central prediction model "refers to any centralized statistical system for the prediction of academic success at a given educational level from achievement at a previous level." The notion of central prediction is related, of course, to Bloom and Peters' methods of adjusting high school grades more efficiently to predict college grades.

Tucker (1963) has developed several general mathematical models for central prediction systems in which several predictor variables and several criterion variables are included for all schools and all colleges in a system. A basic assumption is that the distribution of grades is not the same for either schools or colleges. Bashaw (1965a) has modified Tucker's prediction model and applied it to the study of junior college transfer students in the state of Florida with promising results.

Although not formally identified as such, Hills' work in the University System of Georgia is the best example of a central prediction model using linear regression techniques. For eight years Hills provided a norms booklet in which prediction equiations were presented for each unit in the University System. Also presented in the norms booklet were the distribution of SAT scores and high school averages for each unit (Hill, et al., 1958-65).

Bashaw (1965b) has published a study in which he compares the effectiveness of Tucker's central prediction system, standard regression techniques such as those used by Hills, and his own modified version of Tucker's technique. The results indicate both Bashaw's method and standard regression techniques are more effective than Tucker's model. Bashaw's method compares quite well with standard regression techniques, but Bashaw recommends that both kinds of analyses be made and the user select the one most suitable for his particular situation.

## Summary

This paper has been an attempt to review briefly some of the problems encountered in institutional studies of the admissions process. No effort has been made to summarize or criticize the hundreds of studies published since 1900, but enough studies have been cited to substantiate to some degree the writer's biases.

The major criticism presented here is that too much effort has been directed to the problems of predicting academic grades. Efforts to improve the prediction of grades may have excluded from educational researchers' vision the need for a better understanding of other factors involved in college admissions. The sources of variation in student performance require more intensive study than they have received in the past, and the development of more adequate criteria of academic success remains the most important challenge in admissions research.

In reviewing the numerous efforts to improve predictive efficiency, it is hoped that the need for a broader perspective becomes evident. The grade-point-average is a convenient criterion of academic performance, but it has served as the only criterion in too many institutional studies. Despite an increasing sophistication in measurement and statistical techniques, there is no overwhelming evidence that we can predict college grades better than did the first generation of educational researchers.

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# NEEDED RESEARCH IN COLLEGE ADMISSIONS

Cameron Fincher
Institute of Higher Education
University of Georgia

The needs for research in college admissions are many and various. For those who believe that their particular institution does not have the time, resources, or facilities to examine more closely their admissions program, the answer may well be that they cannot afford not to. The costs of no research will, in the long run, exceed the costs of some research. And the cost of systematic research will always be less than the costs of spasmodic or haphazard research. In this connection, it is well to mention that good research is not so much a matter of time and money as it is a function of clear, critical thinking.

The purpose of this paper is to take a look at college admissions and to let a few mental wheels spin freely. If a few utopian notions creep in, we can keep one eye on them while we examine constructively with the other eye what needed research is. But with both eyes, we should take a good look at what we know about college admissions, and we should be both able and willing to recognize what we do not know.

Some research needs in college admissions can be met only through concerted efforts among groups of institutions; others can be met best by national studies or surveys. Most of the research needs discussed here, however, can be met by the willingness of individual institutions to examine their own admission procedures in a critical manner and to report for open discussion their findings so that other institutions may benefit from their experience. This is, in essence, the writer's own conception of institutional research at its best--the willingness of one institution to examine critically some aspect of its own operations while maintaining concern for its meaningfulness for other institutions of higher education.

## Recruitment Versus Selection

One of the more important needs for research in college admissions is a better understanding of the relationship between the recruitment practices and the admissions policies of institutions. Many colleges are apparently able to attract many applicants whom they do not want while others are unable to attract the students they would select. The "halo effect" has long been recognized in industry, but few colleges or universities have examined closely the influence of prestigious graduate or professional programs upon their recruitment practices at the undergraduate level. It would be advisable, therefore, to study in more detail just what the reputation or "image" of a particular institution is, how the reputation was obtained, what effect it has upon recruitment practices, and how it influences the admissions program. It is conceivable that some students are attracted to certain institutions on the basis of prestigious programs and are selected by the institutions when their undergraduate programs are not actually in best keeping with the students' objectives and expectations.

### The Effectiveness of Recruitment Procedures

Many colleges could study, with great benefit, the devices by which they attempt to recruit students. The amount of money spent on brochures, pamphlets, and catalogs is no small sum--even in small colleges. There is good indication that college catalogs have become more attractive over the years, but little evidence that they have become more readable. The question, however, is how effective printed materials are in attracting the students that the college is looking for.

John Sullivan (1966) has investigated the program of visitation by college representatives to high schools in Georgia. One of his findings was that college presidents were frequently dubious of the value of sending a representative to the high schools. Some felt, however, that it was necessary because of competition while others thought it necessary in order not to be conspicuously absent; in brief, though doubting the value of the program, the college presidents felt trapped by it.

Sullivan's study of the college night program is but one example of research needed to evaluate the effectiveness of a college's recruitment efforts. Other areas of research might include studies of the nature and type of information actually desired by prospective students; the kinds of information actually needed by high school counselors; the relative effectiveness of press releases, filmstrips, motion picture films, and talks by alumni; and--not the least of subjects to be studied--the influence of college administrators and faculty members.

## The Selection Process

Definitely needed in admissions research is a more systematic inquiry into the selection process itself. Some colleges are following a procedure of selecting students that may long have been outmoded. It would not seem impertinent, therefore, to suggest that most colleges could benefit from a closer look at the manner in which they select students. Aspects of the selection process in need of investigation include the nature of the information gathered from applicants, the actual uses to which the information is put, and the nature of the information upon which the decision to admit or reject is actually made.

The validity of admission requirements in general is a subject many colleges have failed to question. We have apparently forgotten that several studies in the 1930's and the 1940's demonstrated that no particular pattern of courses in high school guaranteed success in college. Yet, few colleges fail to specify the number and pattern of high school units that must be submitted by the applicant. If asked to justify with empirical evidence the reasons for setting such admission requirements, most college admissions officers and registrars would find themselves in a highly indefensible position.

Most colleges have established--presumably on the basis of experience--a sequence that must be followed in making application. Frequently the sequence becomes a series of hurdles that can only be taken one at a time. This often results in a time consuming process for admissions personnel and an exhausting ordeal for the applicant. What appears to be logical sequence in the admissions process may well turn out, upon investigation, to be both illogical and quite expensive.

In brief, it would appear that the selective process in many colleges could be studied with benefit from a systems analysis approach. Admissions officers have attempted to establish a logical, orderly procedure for processing applications. It is safe to speculate that some have succeeded in doing so while others have not.

## Policy and Decision Making

Perhaps the most important research needed in admissions is systematic inquiry into the manner and means of making policies and decisions. The typical admissions process is a series of choice points and decisions for both applicants and admissions personnel. The prospective student must decide to make application to college and he must choose the colleges to which he will apply. Upon initial contact by the applicant, persons in admissions work must make a series of decisions and choices before a final letter of acceptance can be sent. That we know so little about how decisions and choices of this nature are made is indicative of the research needed.

## Admissions Policies

The need to understand how admissions policies are made and the need to understand the respective roles of admissions officers, registrars, presidents, other administrators, and faculty members would seem to be paramount. Eighty-seven percent of the subjects in Hauser and Lazarsfeld's study (1964) reported the existence of an admissions committee in their particular college. The committees varied appreciably in composition, some being small with little faculty representation while others were large with heavy faculty representation. The more selective the college the greater the numerical preponderance of faculty members.

Yet, despite the fact that in most formal admissions committees faculty members outnumber representatives of the administration, the admissions officers perceived their own influence in setting admissions policies to be as strong as that of the admissions committee. For changing admissions policies, they perceived themselves as having more influence than the committee. It is of interest to note, therefore, that 90 percent of the responding admissions officers believed themselves to have a proper amount of freedom in admitting students. They also felt that they should have some influence in curriculum matters, but they wisely refrained from seeking influence in athletics.

Hauser and Lazarsfeld's study is highly suggestive of institutional studies into the establishment of admissions policies. Although the study barely scrapes the surface in studying the attitudes and opinions of admissions officers, it does indicate that admissions officers are more closely identified with the administration of the college than with its faculty.

### Decision Making by the Admissions Officer

Equally needed research in the area of admissions pertains to the decision making activities of the admissions officer. The need here is a better understanding of how the admissions officer makes the final decision to reject or to admit the individual applicant. There is a need to know what information he regards as important about the applicant, how he weighs or evaluates the information, and how he uses that information in making a decision. Since Hauser and Lazarsfeld have reported that only a few admissions officers have a minimum predicted grade-point-average below which they will not accept an applicant, and since a majority attached considerable importance to personal interviewing, it would seem that inquiry into the admissions officer's decision making should prove most interesting. It would be of value to know what factors and conditions influence the admissions officer's perception of the applicant; how he judges the applicant's goals, attitudes, opinions, and beliefs; and how he establishes priorities in his decision to admit or to reject. In brief, it should be of value to study the admissions officer as an information-processing system.

Speaking of information systems, it is of interest to note that admissions officers do not fear displacement by computers. Hauser and Lazarsfeld found that only 1 percent of their subjects thought that computers would make all admissions decisions 20 years from now. Fifty-eight percent believed that computers will play a major role in admissions decisions, but 27 percent reported that computers would play only a minor role.

## Counseling and Advisement

Although frequently mentioned in connection with admissions and often an inherent part of the admissions process, there is still a need for a better understanding of the functions of advisement and counseling as they relate to admissions work. Since, according to the subjects of Hauser and Lazarsfeld's study, admissions officers spent such a large proportion of their time interviewing applicants, it would be interesting to know if admissions officers regarded counseling and advisement as a related function, what efforts they make to provide advisement and counseling services in the admissions process, and to what extent they refer prospective students for counseling services.

## High School Counselors

The role of the high school counselor is one deserving more attention than it has received. It is generally recognized in industry that once job requirements become known, there is a tendency for the unqualified applicant to eliminate himself from consideration. To what extent high school counselors eliminate potential applicants by advising them not to apply is a question deserving the attention of all admissions officers. As documents such as the *Manual of Freshman Class Profiles*, published by the College Entrance Examination Board, and the *Counselor's Guide to Georgia Colleges*, developed by John Hills (Hills, Klock, and Bush, 1965), become more accessible to high school counselors, they will play an increasingly important role in admissions work. In the meantime, it would seem imperative to study the uses made of such documents. That some counselors will use such materials well and that some will not is highly probable.

Each institution should attempt to investigate its "image" among high school counselors serving schools from which the college attracts applicants. How well informed the counselors are about the college, what kinds of information they use in working with students who are applying to college, and how much influence they have over the student's final choice are questions to which any admissions officer would like to know the answer. In this respect, it would seem especially relevant to know the role of test data in high school counseling. Some counselors may actually be doing the college and the student a disservice by making recommendations solely on the basis of test data. Since Hauser and Lazarsfeld report that high school counselors are the persons outside the college who are most likely to disagree with an admissions decision, it may well be that with friends such as some colleges have, they can't afford enemies.

## Admissions Problems of the Transfer Student

A subject receiving a considerable amount of attention in the past few years is that of the junior college transfer student. Dorothy Knoell and Leland Medsker (1965) have documented many of the problems encountered in transfer from two year colleges to four year colleges, and a national Joint Committee on Junior and Senior Colleges has published a set of Guidelines for Improving Articulation Between Junior and Senior Colleges. A recent study completed by this writer (Fincher, 1967) indicates, however, that the transfer problem may be more extensive than commonly recognized. We have long known that college students were a highly mobile group, but a state-wide study of transfer students in both public and private colleges indicated that students transfer at all levels of academic progression. Not only do students transfer from two year colleges to four year colleges, but they transfer from junior college to junior college, from senior college to junior college, and back again. Some students before earning a baccalaureate degree may have enrolled in and earned credit at a half dozen colleges or more.

It is evident, therefore, that more systematic investigation of transfer students, their problems, and the problems they cause is greatly needed. For some colleges and universities, the admissions process for transfer students has become as extensive as that for entering freshmen. With the development of the College-Level Examinations, Educational Testing Service has moved to provide some assistance in the matter. But colleges using these tests for selection of transfer students will need both research and experience with the tests before they can use them in the same manner in which the Scholastic Aptitude Test and the Graduate Record Examinations are used.

## Development of Other Criteria

One of the most urgent needs in admissions research is the development of other criteria for the evaluation of the admissions process. The work of the research staff of the American College Testing Program is suggestive of how other criteria can be developed, and research with National Merit Scholars amply demonstrates the need for post-collegiate criteria. Unfortunately, the magnitude of the need does not lessen the difficulties of developing such criteria. Most institutions have been unable to move beyond specifying degree requirements in terms other than academic units or credits and grade averages. For four year liberal arts colleges the institutional testing program for the Graduate Record Examinations is a valuable means of evaluating student achievement at the senior level, but little else is available in the way of objective measures of academic accomplishment.

An interesting start in criteria development has been made by Stern, Stein, and Bloom (1956). Their approach was to think in terms of the end-product of education and to attempt to construct models of students who would be the outcome of certain educational programs. Much the same approach has been used by J. Davis (1965) in a series of studies dealing with the "desirable" student as described by college faculty members. Davis has attempted to find out what kinds of traits are valued by those who instruct students and to compare these traits with conventional measures of academic achievement. How successful this particular approach will be in providing meaningful information for use in admissions is an open question at the present time.

## Studies of Student Mix

If, as many critics have pointed out, the effect of most selective admissions programs is to produce a homogeneous student population, it is well that there is an increasing recognition of the need for experimental studies of student mix. Since some colleges have so belatedly come to the conclusion that male and female students can be instructed in the same classroom, it would seem advisable to study the composition of student populations in more detail.

The need for studies of student mix is especially relevant for students from culturally deprived backgrounds. As financial aids become increasingly available for students from low income families, college administrators and faculty members will need to understand how learning of these students is affected both by the college environment and by the characteristics of students already enrolled in the college. The culturally deprived student may respond well to the challenge provided in certain classrooms because his transactions with other students reinforce his efforts to learn. In classes where he is the only "one of his kind" or perceives himself as being such, the situation may be more threatening than conducive to learning. On the other hand, if he finds himself in a classroom predominantly occupied by other culturally deprived students, he may be discouraged from learning because he perceives the course as being second-rate or remedial rather than being the regular college course. How many students from culturally deprived backgrounds are needed in a single class to provide a proper mix is an empirical question yet to be adequately answered.

It has frequently been suggested that each college in the nation should admit a certain proportion of its students on an experimental basis without regard to their qualifications. There are some indications that where students are admitted on an experimental basis and neither they nor their instructors are informed of such, the students achieve at a level substantially above what would ordinarily be expected.

## Drop-Outs and Failures

The admissions program in many colleges may be suspected, with some justification, of being a vestibule operation with little or no actual concern with what occurs after the student is admitted. Although the majority of Hauser and Lazarsfeld's admissions officers felt that they should have some influence in curriculum matters, there is serious question that the typical admissions officer devotes much time to curriculum development. Since 53 percent of the group did assign, however, a high priority to the reduction of drop-outs and failures, recognition of the need for systematic follow-up of admitted students would logically follow. Unfortunately, most follow-ups of admitted students are made with the intention of finding out how well they did--not why did they not do better.

### The Student Who Drops Out

The student who voluntarily withdraws from college before completion of his degree requirements deserves serious study by the administrative official who admitted him. Iffert's (1956) national survey of college drop-outs indicates that the typical entering freshmen has only a fifty-fifty chance of surviving four years of college and earning an academic degree. Yet, the attrition is due more to voluntary withdrawal than failure to maintain academic standards. Since there is good reason to believe that a student who survives academically the first year of college is capable of going the full route, it would appear that more systematic research on the problem of drop-outs is definitely warranted. How much the problem of drop-outs can be reduced through more effective admission procedures is an open question.

## The Student Who is Dismissed

Also, important is the need for a better understanding of the student who is dismissed for failure to maintain academic standards. Perhaps even more important than an investigation of why students fail would be a systematic study of what failure means to them. It is easy to forget that the academic standards that the student fails to maintain are set by the college and usually accepted by society. In other words, the college defines failure--not the student. From the viewpoint of the individual student who fails, it may well be that in terms of his own objectives and expectations, he has not failed. How many students enroll in college with the implicit expectation that they will fail or drop out before graduation is, of course, unknown. But there is reason to believe that some students do actually attend college "for the experience," "for an opportunity to see what college is like," or merely "to enjoy the fun of the football season and the fraternity or sorority rush."

For those who contend that it is harmful to the student to admit him when it is highly probable that he will fail, it is well to counter that we should know more about the student's actual objectives and expectations. It is also well to remember that Kate Hevner Mueller (1961) has said, "Students who do not succeed in their scholastic work will yet carry away with them much that will be of permanent value to them."

## Social Consequences and Implications

From the perspective of higher education in general there is considerable need for research into the social consequences and implications of current admission policies and practices. The increasing demand for higher education has been met by a commendable effort to facilitate access to higher education for those who would seek its benefits. Yet, the rapid expansion of state universities into multiversities and the rapid building of junior colleges has not been without a certain amount of stress. The increasing cost of higher education is undoubtedly one of the reasons for an increasing proportion of students seeking admission to public institutions. If the trend continues as it is projected, more and more public institutions will be forced to become selective in their admissions program.

The necessity of a selective admissions program poses problems. One is how to insure that each institution not be selective for the wrong purposes. Despite the boast of most colleges that they are unique and despite the frequency with which the term "innovation" is used by college administrators, a cynic might rightly suspect that most colleges are more imitative than innovative. In establishing a selective admissions program, it would not seem to be to the advantage of either nation, society, or students for each college to follow the lead of those institutions with highly selective criteria of a strictly intellective nature.

A start in investigating the social implications of college admissions has been made by the Russell Sage Foundation. Although focusing primarily on the uses of standardized tests, the studies have direct implications for college admissions. David A. Goslin (1963) has reviewed testing practices in industry, business, government, and the military services, as well as those in education.

In a public opinion survey of attitudes toward intelligence tests, Orville G. Brim (1965) found that 41 percent of the general public was opposed to using tests to deny admissions to college. Only 25 percent were opposed to using tests for sectioning special classes.

It is evident from these studies that there are social implications for college admissions, that the public is becoming aware of these social implications, and that there is a need for each college to consider more carefully the social consequences and implications of their admission policies and practices.

## Social Implications of the National Testing Agencies

Directly related to the need for inquiry into the social implications of college admissions is a parallel inquiry into the role of national testing agencies such as the College Entrance Examination Board, the American College Testing Program, and the National Merit Scholarship Corporation. That these agencies play an extremely important role in college admissions is obvious. But exactly what this role is and what the social implications of such agencies are is not at all clear. Several critics have received considerable press coverage and a large audience by lashing out against the tests used by these agencies. Setting a straw-man argument that tests are the sole criterion for admission to college, these critics have pictured college admissions in broad Orwellian strokes and splashes.

Critics of the national testing agencies have ignored the fact that no agency has tried as diligently as Educational Testing Service to warn against abuse of tests and to provide educational materials for the proper use of standardized tests. Yet, the effectiveness of Educational Testing Service's efforts is a matter worthy of empirical inquiry. It may well be that, despite their intensive efforts, ETS staff have not succeeded in warning consumers of testing abuses, and that the tests are misused as widely as some critics claim.

In any event, the role of the national testing agencies in college admissions is a subject for needed research. There is a need better to understand the influence of such agencies upon admission policies and practices; the actual uses that college admission officers make of test data in college admissions; and the general social implications of having national testing agencies presently constituted. Also needed is research from the viewpoint of high school counselors--how they perceive the role of the national testing agencies, how they use the various tests distributed by the agencies, and the influence of test data in student decision-making as perceived by the counselor.

## Summary

This paper has been an attempt briefly to review needed research in college admissions.

While some of the topics requiring research are obvious to those concerned with admissions work, it is hoped that some topics have been suggested which are not obvious but nonetheless important. There can be little doubt that there is an increasing awareness of needed research in college admissions, and with the growth of institutional research as a specialized field, research in admissions work should provide some of the more interesting challenges.

The discussion has touched upon a substantial number of interesting leads for research. An appreciable number of research workers are investigating a variety of problems in college admissions. Much of this research is both commendable and challenging. It is hoped that, in some way, this paper will convey some sense of the challenges in admissions research and provide some small measure of stimulation to investigate the admission process with the methods of systematic inquiry required.

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# AN INTRODUCTION TO BUDGETARY ANALYSIS

James L. Miller, Jr.
Center for the Study of Higher Education
The University of Michigan

The relationship between institutional research and institutional budgeting varies greatly from one campus to another. On some campuses these functions are closely interrelated--on others they are not. This usually is a reflection of the particular institutional problems or needs which led to the establishment of the institutional research office. In the long run, however, it is apparent that numerous interrelationships between institutional research offices and budgetary decision makers will develop.

The comments in this paper are designed for those who are not familiar with higher education budgeting. The intent is to provide institutional research people with enough information to enable them to understand what college and university business officers are talking about when they discuss budgets. Hopefully, this will encourage institutional research people to enter into discussions with budget people in their own institutions, leading toward greater cooperation and a greater exchange of information.

Budgets frequently have been described as programs expressed in terms of dollars. Although this is not a new definition of budgeting, it is becoming increasingly apt because of recent developments, particularly the advent of "program budgeting." Several things are implied by the definition of budgeting as program expressed in terms of dollars. One is that the budget is a comprehensive presentation of the institution's activities and programs. For many institutions it is the only place where one can review the total activities of the institution in a single document. Another implication is that dollars become a common vocabulary for discussing dissimilar activities such as building maintenance, student services, and classroom teaching.

Budgetary decision-making usually is inter-related with programmatic decision-making because of the fact that money is necessary to implement most programs. Budgetary decision-making represents a series of "choices" among alternative possibilities. These choices reflect conscious or unconscious decisions about institutional priorities and balance. Insofar as institutional research can provide information and analysis which will improve decision-making, it will make an important contribution to the future well-being of the institution.

In some cases the institutional research office will be involved directly in budgetary analysis and cost studies, and in other cases financial studies will be made by the budget office. The latter situation probably is the most common. Even when the institutional research office is not directly involved in making financial studies, other types of studies made by the institutional research office will have direct or indirect relevance to budgetary decision-making simply because of the fact that budgetary decisions concern themselves with so many different aspects of the total operation of the institution. It is important, therefore, that institutional research people have an understanding of the institutional budget and of financial analysis techniques.

# THE STRUCTURE OF THE BUDGET

## The Principle of Separately Balanced "Funds"

A basic principle in college and university budgeting is that all of the money handled by the institution is not pooled into a single account from which money might be spent for any worthwhile institutional purpose. Instead the money handled by the institution is divided into a series of "funds," each of which has its own sources of income and purpose of expenditure. There are six separate funds at most institutions. These are described in Appendix A. They are:

1) Current Funds
2) Loan funds
3) Endowment and other non-expendable funds
4) Annuity funds
5) Plant funds
6) Agency funds

## Restricted and Unrestricted Funds

Each of the six fund groups is divided into "restricted" and "unrestricted" funds. Restricted funds are those which have some limitation concerning the purposes for which they can be expended (a restriction beyond that implied by the nature of the fund group itself). Restricted funds usually come to the institution earmarked for a particular project or purpose by the donor or contracting agency. For example, unrestricted monies in the current funds could be spent for any purpose designated by the institution, but a donation earmarked by the donor for the support of an Economic Development Research Institute would be placed in a "restricted" current fund account.

The division of each of the six fund categories into restricted and unrestricted segments, results in twelve separate "pockets" into which monies may be placed (Figure 1). Each of these separate fund categories operates independently, that is, the income and expenditures of each must be in balance.

This is often a source of confusion to faculty members and others unfamiliar with the structure of a college budget. The fact that the institution may have money in the bank does not necessarily mean that these monies are freely available for any purpose. Much of the mystery of institutional budgeting disappears when one understands the fund structure.

Observers of institutional budgeting also should be aware that some monies come to the institution without any special designation or restriction, and the institution's chief financial officer, president, or board must then choose the fund category into which these monies will be placed. Most such monies are put into the current unrestricted fund and become available for immediate expenditure, but in some cases they may be placed into one of the other funds--to build up the endowment, or to provide funds for such purposes as construction or student loans. These represent legitimate institutional actions, but they represent the institution's *choice* rather than an externally enforced *restriction*.

FIGURE 1 - FUND GROUP

| | Unrestricted | Restricted |
|---|---|---|
| 1. | Current funds | Current funds |
| 2. | Loan funds | Loan funds |
| 3. | Endowment and other non-expendable funds | Endowment and other non-expendable funds |
| 4. | Annuity funds | Annuity funds |
| 5. | Plant funds | Plant funds |
| 6. | Agency funds | Agency funds |

Current Fund Categories

We have already noted the potential confusion resulting from the existence of twelve "pockets" into which monies can be placed. This potential confusion is further compounded by the fact that the most important fund group--current funds--is subdivided into three major categories:

1) "educational and general"
2) "auxiliary enterprises"
3) "student aid"

And each of these is further subdivided as indicated below.

Educational and general monies are those which are currently available for instructional research, and public services programs and for general administrative expenses associated with the operation of the institution. These are the major expenditures of interest to most institutional personnel. Therefore, this is the category most frequently subjected to intensive analysis. Educational and general expenditures are subdivided into the following eight subcategories which are described in Appendix B:

1) General administration
2) General expense
3) Instruction and departmental research
4) Organized activities relating to educational departments
5) Organized research
6) Extension and public service
7) Libraries
8) Operation and maintenance of the physical plant

Student aid funds, as the name suggests, are those funds utilized for scholarships, fellowships and prizes.

Auxiliary enterprises are those institutionally operated activities which do not actually constitute a part of the educational program (such as dormitories, cafeterias, student unions, book stores, etc.). At most institutions these activities are self-supporting, and therefore it is important to separately account for their income and expenditures. Such a separate accounting provides information on whether they are genuinely self-supporting. A separate accounting for auxiliary enterprises also keeps the picture clear concerning which monies are available for "educational" purposes and which are earmarked for other purposes.

In summary, the structure of the budget includes three major levels for categorizing expenditures--the six "funds" (each of which may have its restricted and unrestricted side); the separate categories within funds, the most important of which (for financial analysis) are the three categories within the current fund; and finally the sub-classifications within each category, the most important of which are the eight sub-classifications within the educational and general classification.

## BUDGETARY ANALYSIS

### Purposes of Budget Analysis

Budget analysis constitutes the link between raw financial data and the use of those data for interpretive and planning purposes. Budgetary analysis reveals the patterns in the institution's expenditures. The patterns themselves often tell a meaningful story. When the patterns are compared to other normative patterns, it is usually possible to make some interpretations and judgments concerning them.

Reports growing out of budgetary analyses may be used for a variety of purposes. One of the most common is external reporting--the presentation of information to an audience outside the institution itself. State legislatures and state agencies concerned with higher education planning and coordination often require such reports on institutional finance. Private institutions, although less often "required" to submit such reports, often choose to do so as a method of informing donors, past or prospective, about the institution's needs and its managerial efficiency. Budgetary analysis also is used for internal purposes, especially when it can be tied in closely with institutional budgeting and long-range planning. In these cases budgetary analysis may constitute one of the bases for decision-making concerning the allocation of money among competing claimants.

In this presentation the term budgetary analysis is used fairly loosely. Lest this create confusion, it should be noted that there are important distinctions between budgetary analysis (or cost accounting), on the one hand, and budget "formulas" on the other. Budgetary analysis is done after the fact (whether it is after expenditures actually have been incurred or after a budget is developed) and therefore the analysis can be made in considerable detail. Formulas are developed prior to detailed budgeting and serve the purpose of providing estimates which are useful for the allocation of resources. Formulas can provide only an approximation of the resources needed by various parts of the total organization.

It should be noted also that there are important differences between studies in single institutions and inter-institutional studies. In the latter case the usual difficulties associated with making an analysis are further complicated by problems specifically related to the inter-institutional nature of the project. Among the most frequently encountered difficulties are problems associated with insuring comparability of information, respecting confidentiality to the degree desired by each of the institutions, and making comparisons among activities which are similar but not identical. Individual institutions can take advantage of the comparisons which are possible because of the increasing availability of public information about other institutions or groups of institutions. Such information provides norms against which an individual institution can compare itself. Studies of state systems provide one such source of readily available information.

also is used for internal purposes, especially when it can be tied in closely with institutional budgeting and long-range planning. In these cases budgetary analysis may constitute one of the bases for decision-making concerning the allocation of money among competing claimants.

In this presentation the term budgetary analysis is used fairly loosely. Lest this create confusion, it should be noted that there are important distinctions between budgetary analysis (or cost accounting), on the one hand, and budget "formulas" on the other. Budgetary analysis is done after the fact (whether it is after expenditures actually have been incurred or after a budget is developed) and therefore the analysis can be made in considerable detail. Formulas are developed prior to detailed budgeting and serve the purpose of providing estimates which are useful for the allocation of resources. Formulas can provide only an approximation of the resources needed by various parts of the total organization.

It should be noted also that there are important differences between studies in single institutions and inter-institutional studies. In the latter case the usual difficulties associated with making an analysis are further complicated by problems specifically related to the interinstitutional nature of the project. Among the most frequently encountered difficulties are problems associated with insuring comparability of information, respecting confidentiality to the degree desired by each of the institutions, and making comparisons among activities which are similar but not identical. Individual institutions can take advantage of the comparisons which are possible because of the increasing availability of public information about other institutions or groups of institutions. Such information provides norms against which an individual institution can compare itself. Studies of state systems provide one such source of readily available information.

## Historical Background of Budgetary Analysis

The history of budgetary analysis represents the interweaving of many forces and interests. These include the development of a uniform accounting system for American higher education; the development and initial popularization of cost analysis procedures by a group I shall refer to as the "Chicago school;" the pressures for adoption of budgetary analysis procedures which have emanated from state agencies since the early 1950's; and finally the contemporary emergence of the Planning-Programming-Budgeting System (PPBS) movement.

The development of a uniform accounting system for all institutions of higher learning does not sound like a very exciting piece of history, but it was the sine qua non for any interinstitutional financial comparisons. Without a common "vocabulary" and commonly accepted "rules of the game," it was impossible to compare one institution with another and it also was impossible to develop normative data against which individual institutions might measure their own performance. There were several early attempts by individuals to develop an accounting system which all colleges and universities would accept. This laid the groundwork for the appointment, in 1930, of a National Committee on Standard Reports for Institutions of Higher Education. That committee developed a classification procedure, published in 1935, which still provides the basic structure for college and university accounting systems. Two subsequent revisions of that report have been prepared, both by committees of college and university business officers. The first revision was published by the American Council on Education in 1952 as College and University Business, Volume I. A second revision is currently under way with the results scheduled for publication in 1968 by the American Council on Education.

Adoption of the uniform system by individual institutions proceeded slowly at first, but today it is used almost universally because of the fact that so many governmental reports must be based upon it. The major outlines of that accounting system were discussed earlier in this paper and are presented in somewhat more detail in Appendices A and B.

What I have chosen to call the "Chicago school" was a remarkable group of faculty members at the University of Chicago in the late 1920's and early 1930's who turned their attention to the study of higher education organization and administration. The group included Floyd Reeves, John Dale Russell, A. J. Brumbaugh, Lloyd Blauch, and others. A series of multi-institutional studies were conducted and published which for the first time provided normative information about institutional organization, administration, finance, curriculum, staffing, physical plant facilities, and many other matters. Although the works produced by this group are principally of historical interest today, they laid the groundwork for much that has happened during the 1950's and 1960's. Among other things, the system they developed for analyzing and comparing institutional patterns of income and expenditure was to reappear in the 1950's as the most widely used system of budgetary analysis. The work done by this group also provided the basis for a complete overhaul of the accrediting procedures used by the North Central Association (changes which ultimately were accepted by other accrediting associations).

Not all of the work initiated by the Chicago school has been replicated. One piece of work which is generally overlooked and which has particular significance to small institutions is the table developed by John Dale Russell and Floyd W. Reeves that provides a series of corrective "weightings" that can be used by institutions with less than 1,000 students to adjust calculations of expenditure per student so as to make their expenditures comparable to norms established for larger institutions. It is commonly recognized that small institutions have certain inherent inefficiencies such as the necessity for providing a basic library, faculty, and physical facilities, plus certain unavoidable overhead costs. The small enrollment means that the cost of this basic program on a per student basis is higher than would be true if the enrollment were larger. Small institutions may know this to be true but often are at a loss to know how great the cost of this inefficiency is in terms of dollars and cents. The Russell-Reeves table quantifies this. It is reproduced here because it is not generally available in other sources (see Table 1). The dollar figures are badly out of date because of the fact that the table was published over 30 years ago, but there is reason to believe that the weightings are still reasonably accurate. The significant columns in the table are Column 1 which shows the enrollment groupings and Column 3 which indicates the weighting that should be used as a multiplier in reducing the actual cost per student before attempting to make comparisons with larger colleges. The table has a number of uses. In interinstitutional comparisons it provides an appropriate "handicap" for smaller institutions to make comparisons more reasonable. In estimating budgetary needs for a small college it provides a basis for estimating the amount of extra funding the institution will need on a per student basis because of its small size. It also provides food for thought for small institutions which are wondering about the economics involved in increasing their enrollments. Obviously a larger enrollment will require increased institutional support, but the amount needed per student to do an equivalent educational job will drop.

The years between 1935 and 1950 saw very little interest or activity in the area of institutional budgetary analysis. The Second World War intervened

## TABLE 1

## WEIGHTING FOR EXPENDITURE AND INCOME DATA TO ACCOUNT FOR SIZE OF ENROLMENT, AND MATHEMATICAL EVIDENCES OF THE PROGRESSION OF THE WEIGHTING CURVE

| Enrolment Group (1) | Co-ordinate Reading (Dollars of Expenditure per Student, Quality Being Invariable (2) | Weighting (Co-ordinate Reading Divided by 205.00) (3) | Difference from Preceding Co-ordinate Reading (4) | Increment in Difference (5) |
|---|---|---|---|---|
| Over 1,050 | 205.00 | 1.0000 | 0.0 | --- |
| 1,031-50 | 205.40 | .9981 | 0.4 | --- |
| 1,011-30 | 206.50 | .9927 | 1.1 | --- |
| 991-1,010 | 207.70 | .9870 | 1.2 | 0.1 |
| 971-90 | 209.00 | .9809 | 1.3 | .1 |
| 951-70 | 210.40 | .9743 | 1.4 | .1 |
| 931-50 | 211.90 | .9674 | 1.5 | .1 |
| 911-30 | 213.50 | .9602 | 1.6 | .1 |
| 891-910 | 215.20 | .9526 | 1.7 | .1 |
| 871-90 | 217.00 | .9447 | 1.8 | .1 |
| 851-70 | 218.90 | .9365 | 1.9 | .1 |
| 831-50 | 220.90 | .9280 | 2.0 | .1 |
| 811-30 | 223.00 | .9193 | 2.1 | .1 |
| 791-810 | 225.20 | .9103 | 2.2 | .1 |
| 771-90 | 227.50 | .9011 | 2.3 | .1 |
| 751-70 | 229.90 | .8917 | 2.4 | .1 |
| 731-50 | 232.40 | .8821 | 2.5 | .1 |
| 711-30 | 235.00 | .8723 | 2.6 | .1 |
| 691-710 | 237.70 | .8624 | 2.7 | .1 |
| 671-90 | 240.60 | .8520 | 2.9 | .2 |

TABLE 1--Continued

| Enrolment Group (1) | Co-ordinate Reading (Dollars of Expenditure per Student, Quality Being Invariable (2) | Weighting (Co-ordinate Reading Divided by 205.00) (3) | Difference from Preceding Co-ordinate Reading (4) | Increment in Difference (5) |
|---|---|---|---|---|
| 651-70 | 243.70 | .8412 | 3.1 | .2 |
| 631-50 | 247.00 | .8300 | 3.3 | .2 |
| 611-30 | 250.50 | .8184 | 3.5 | .2 |
| 591-610 | 254.20 | .8065 | 3.7 | .2 |
| 571-90 | 258.20 | .7940 | 4.0 | .3 |
| 551-70 | 262.50 | .7810 | 4.3 | .3 |
| 531-50 | 267.10 | .7675 | 4.6 | .3 |
| 511-30 | 272.00 | .7537 | 4.9 | .3 |
| 491-510 | 277.30 | .7393 | 5.3 | .4 |
| 471-90 | 283.00 | .7244 | 5.7 | 0.4 |
| 451-70 | 289.10 | .7091 | 6.1 | 0.4 |
| 431-50 | 295.70 | .6933 | 6.6 | .5 |
| 411-30 | 302.80 | .6770 | 7.1 | .5 |
| 391-410 | 310.40 | .6604 | 7.6 | .5 |
| 371-90 | 318.60 | .6434 | 8.2 | .6 |
| 351-70 | 327.40 | .6261 | 8.80 | .6 |
| 331-50 | 336.90 | .6085 | 9.50 | .7 |
| 311-30 | 347.10 | .5906 | 10.20 | .7 |
| 296-310 | 358.10 | .5725 | --- | --- |
| 286-95 | 363.95 | .5633 | 5.85 | --- |
| 276-85 | 370.00 | .5541 | 6.05 | .2 |
| 266-75 | 376.35 | .5447 | 6.35 | .3 |
| 256-65 | 383.00 | .5352 | 6.65 | .3 |
| 246-55 | 389.95 | .5257 | 6.95 | .3 |
| 236-45 | 397.30 | .5160 | 7.35 | .4 |

TABLE 1--Continued

| Enrolment Group (1) | Co-ordinate Reading (Dollars of Expenditure per Student, Quality Being Invariable (2) | Weighting (Co-ordinate Reading Divided by 205.00 (3) | Difference from Preceding Co-ordinate Reading (4) | Increment in Difference (5) |
|---|---|---|---|---|
| 226-35 | 405.05 | .5061 | 7.75 | .4 |
| 216-25 | 413.20 | .4961 | 8.15 | .4 |
| 206-15 | 421.85 | .4860 | 8.65 | .5 |
| 196-205 | 431.10 | .4755 | 9.25 | .6 |
| 186-95 | 440.95 | .4649 | 9.85 | .6 |
| 176-85 | 451.50 | .4540 | 10.55 | .7 |
| 166-75 | 462.85 | .4429 | 11.35 | .8 |
| 156-65 | 475.10 | .4315 | 12.25 | 0.9 |
| 146-55 | 488.35 | .4198 | 13.25 | 1.0 |
| 136-45 | 502.70 | .4078 | 14.35 | 1.1 |
| 126-35 | 518.25 | .3956 | 15.55 | 1.2 |
| 116.25 | 535.30 | .3830 | 17.05 | 1.5 |
| 106-15 | 554.25 | .3699 | 18.95 | 1.9 |
| 96-105* | 575.90 | .3560 | 21.65 | 2.7 |
| 86-95 | 601.65 | .3407 | 25.75 | 4.1 |
| 76-85 | 633.15 | .3237 | 32.50 | 6.75 |
| 66-75 | 675.50 | .3035 | 42.35 | 9.85 |
| 56-65 | 732.00 | .2801 | 56.50 | 14.15 |
| 46-55 | 808.50 | .2536 | 76.50 | 20.00 |
| 41-45 | 846.50 | .2422 | 48.00 | --- |
| 36-40 | 914.00 | .2243 | 57.50 | 9.50 |

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*The weightings for the institutions with less than 100 students are not as stable as the weightings for institutions of larger enrolment. Only a few institutions with small enrolment were available for the study, and the reference points were insufficient for determining accurately the behavior of the weighting curve in the lower brackets. The mathematical behavior of the curve in the lower extremity is, however, essentially the same as in other parts of the enrolment scale.

TABLE 1--Continued

| Enrolment Group (1) | Co-ordinate Reading (Dollars of Expenditure per Student, Quality Being Invariable (2) | Weighting (Co-ordinate Reading Divided by 205.00) (3) | Difference from Preceding Co-ordinate Reading (4) | Increment in Difference (5) |
|---|---|---|---|---|
| 31-35 | 983.00 | .2085 | 69.00 | 12.50 |
| 26-30 | 1,066.00 | .1923 | 83.00 | 14.00 |
| 21-25 | 1,168.00 | .1755 | 102.00 | 19.00 |
| 16-20 | 1,296.00 | .1582 | 128.00 | 26.00 |

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during this time, and the post-war veterans' enrollment boom consumed institutional energies. In the early 1950's the veteran enrollment began to be replaced by non-veterans, and Federal financial support under the GI Bill no longer provided a major source of support for students or institutions. The state governments found themselves faced with rapidly mounting higher education appropriations and became increasingly interested in securing more information about these appropriations--the purposes for which they were needed, the "efficiency" with which they were managed, and the possible effects of reducing requested appropriations. This interest grew stronger as enrollments in state-supported colleges and universities mounted more and more rapidly during the 1950's and 1960's. One result of this concern was the establishment in virtually every state of a state level higher education planning and coordinating agency. Another result was the adoption in many states of some form of statewide budgetary analysis. The procedures adopted tended to vary from one state to another.

One of the best procedures was developed by John Dale Russell for the New Mexico Board of Educational Finance in the early 1950's. The procedure drew heavily upon the work Russell himself had done as a member of the "Chicago school" in the early 1930's. A detailed description of this procedure was published in two different places, and the procedure has had wide influence. Russell and his associate, James I. Doi, prepared a series of 12 articles for College and University Business magazine describing this system. These articles appeared between September, 1955 and August, 1966. Subsequently Russell modified this material slightly for presentation at a conference, the proceedings of which were published in 1960 by the Western Interstate Commission for Higher Education under the title College Self-Study: Lectures on Institutional Research (Richard G. Axt and Hall T. Sprague, editors). Neither the College and University Business series nor the WICHE publication are currently available from the publishers, but they can be located in many libraries or in the business offices on many college and university campuses.

Other states which have developed procedures for budgetary analysis or formulas for estimating future budgetary needs (which usually were based upon a rough analysis of cost patterns) include California, Indiana, Oklahoma, Texas, Kentucky, Colorado, Florida, Utah, and Virginia. In recent years a number of additional states have moved in the same direction.

The Ford Foundation through its Fund for the Advancement of Education provided the stimulus for a series of interinstitutional cost studies which not only provide useful normative information but also helped greatly in the development of cost analysis techniques. Among these studies were the two "60-college studies" (A Study of Income and Expenditures in Sixty Colleges--Year 1953-54, and A Second Look at the Sixty College Study: Comparison of Financial Operating Data for 1957-58 with a Study of Income and Expenditures in Sixty Colleges--Year 1953-54); the "California-Big Ten Study," (California and Western Conference Cost and Statistical Study: 1954-55); and Sidney G. Tickton's Needed: A Ten-Year College Budget, (New York, Fund for the Advancement of Education, 1961).

The two "60-college studies" provided normative information in great detail for small and medium-sized colleges. The California-Big Ten report did not report much detail but provided a good discussion, with supporting illustrative data, of a methodology for cost analysis in large, complex universities. Tickton's work dealt with the analysis of curriculum and expenditures in small or medium-sized colleges, as did the writing of Beardsley Ruml and Donald H. Morrison (Memo to a College Trustee), Earl J. McGrath (Memo to a College Faculty Member), and of Hungate, Meeth, and O'Connell

("The Quality and Cost of Liberal Arts College Programs: A Study of Twenty-Five Colleges," in *Cooperative Long-Range Planning in Liberal Arts Colleges*, edited by Earl J. McGrath).

The message in this growing literature on budgetary analysis, particularly as it interlocks with program analysis, is that institutions can make better decisions about their financial expenditures *and can support better educational programs* if they will expand and integrate their efforts at (1) long-range planning, (2) program analysis, and (3) budgetary analysis.

The recent emergence of PPBS (Planning-Programming-Budgeting Systems) and its application to higher education institutions is, in some respects, simply a further extension of the trends which have been noted above--trends toward increasingly sophisticated quantitative analysis and toward more complex interrelationships between program analysis and fiscal analysis. The concepts of PPBS first developed in the field of public administration, with particular applicability to large Federal agencies with complex administrative problems. The Department of Defense was the major testing ground for PPBS and the technique has been highly successful there. This has led to wide-spread interest in it and to proposals for its adoption throughout the Federal government and in state and local governments as well. There is the further suggestion that it be adopted in large universities where administrative problems are fully as complex as are those of many governmental agencies. Such a proposal was made in 1966 by Harry Williams in *Planning for Effective Resource Allocation in Universities*, published by the American Council on Education.

Long-range planning is at the heart of the PPBS proposals. Analytical information of many kinds is brought to bear during the planning process. The adoption of any form of PPBS will increase an institution's need for analytical studies of all kinds--a matter of no small interest to institutional research offices.

## Techniques Used in Budget Analysis

Two basic techniques are utilized in most cost analysis procedures--percentage analysis and unit cost analysis. The first involves computing the percentage which is expended for various sub-categories. The second technique involves computing a unit cost that relates the dollars expended to services received. These are discussed in greater detail below.

### "Percentage Analysis" Technique

The percentage analysis technique consists of computing the percentage of the total cost which is devoted to each of the sub-items. The object is to find and understand the patterns of expenditures and the reasons for variation in these patterns.

Two key generalizations about percentage analysis are: 1) the fact that there is a pattern which can be identified, and 2) the fact that there is wide variation among institutions in the patterns which they display.

Table 2, which is taken from the descriptions of institutional financial analysis by John Dale Russell and James I. Doi referred to earlier, shows a pattern for six institutions in which the average pattern involves almost 60% of expenditures going for instruction and approximately 17% for plant operation and maintenance, 16% for administration and general, 5% for libraries, and small percentages for extension and organized research. These are the normative data against which the six institutions individually can be compared.

It is important to note the wide variation among the six institutions, however. The percentage of expenditures which goes for instruction ranges from 48% to almost 62%. The percentage for plant operation and maintenance ranges from 15% to over 30%. The percentage for administration and general ranges from 14% to over 22%. These figures clearly indicate the two generalizations just made--there is a pattern (instruction consistently gets the

## TABLE 2

### Percentage Distribution of Total Educational and General Expenditures for Each Function for Each of Six State Institutions of Higher Education for 1954-55, and Average for All Six Institutions Combined for Five-Year Period, Including Budget for 1955-56

| Institution | Full-Time Equivalent Enrollment | Administration & General | Instruction | Organized Research | Extension | Libraries | Plant Operation and Maintenance |
|---|---|---|---|---|---|---|---|
| "A" | 3,727 | 14.6 | 61.0 | 1.6 | 2.4 | 5.5 | 14.9 |
| "B" | 1,702 | 14.6 | 61.8 | 0.2 | 0.0 | 5.3 | 18.1 |
| "C" | 925 | 14.0 | 60.1 | --- | 0.3 | 4.9 | 20.7 |
| "D" | 464 | 21.8 | 50.4 | --- | 3.0 | 5.1 | 19.7 |
| "E" | 967 | 22.2 | 54.4 | --- | 2.7 | 5.7 | 15.0 |
| "F" | 174 | 15.9 | 48.4 | --- | --- | 4.3 | 31.4 |
| Weighted average for 1954-55 | | 15.9 | 59.0 | 0.8 | 1.7 | 5.3 | 17.3 |
| Five-year average for all institutions combined | | 15.7 | 58.9 | 0.8 | 1.6 | 5.3 | 17.7 |

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largest percent, for example), while at the same time there is tremendous variation from one institution to another.

What are the causes of this variation? The following factors stand out:

1. Institutional size and complexity. Small institutions have relatively high overhead costs for such things as administration and the upkeep of the physical plant, because these costs tend to be fixed. This reduces the percentages which can go for other things. As an institution grows larger these fixed expenditures represent a smaller proportion of the total. The percentage expended for administration and general declines and larger amounts are made available for other purposes. Institutions which are quite large and complex normally have high expenditures for organized research and for extension, which reduces the percentage spent for instruction. Therefore, other things being equal, instruction will receive the highest percentage of total expenditures in medium sized institutions which are large enough to be administratively efficient but not large enough to have developed major research and extension activities.
2. Geographic location. The costs of many things, such as utilities, labor, and police protection, vary in accordance with the geographic location of the institution. Heating costs, for example, will vary with climate and labor costs may differ markedly between urban and rural locations.
3. Adequacy of Resources. The adequacy of resources becomes an important factor in determining whether there is enough money to properly fund the instructional program as well as the many fixed

overhead costs which are unavoidable. An institution will first pay for those things which it must buy and will then put its money into other things which it values. In general, a poor institution (financially) will be forced to spend a disproportionately high proportion of its resources on administration and physical plant upkeep, whereas an institution with more adequate resources will be able to put a higher proportion of its funds into instruction and libraries.

4. Type of institutional programs. The percentage distribution of expenditures will be influenced to a significant degree by the type of program offered by the institution. The best example of this is found in land grant universities that have major agricultural extension programs. These programs of off-campus agricultural service consume a large enough proportion ot total institutional expenditures to make the percentage analysis show lower percentages for other activities. If the institution's percentage analysis is re-computed, omitting the extension expenditures, the pattern may approximate that of other institutions. The presence or absence of a demonstration school for teacher training purposes is another example of a major expenditure which influences the percentage shown for all other activities.

5. Matters of institutional choice. A certain degree of variation is attributable simply to choices made by the institution about such things as the level of administrative services, the relative emphasis placed upon campus beautification, or the relative emphasis placed upon library development. Some institutions choose to put all the money they possibly can into faculty salaries; other institutions choose to provide a "balance" among such things as faculty

salary levels, library adequacy, campus beautification, and administration.

To emphasize the point made earlier, there is wide variation in institutional expenditure patterns, but they are variations on a theme. One needs to understand both the basic pattern common to most institutions and the types of variations most frequently encountered.

Normative information. Analysis consists of finding the pattern in an institution's expenditures; normative information provides the basis for meaningful interpretation. Norms can be derived from a variety of sources. There is a growing body of literature which makes available normative information from various groups of institutions.

The best normative information for purposes of institutional decision-making is information about expenditure patterns over a series of years within the institution itself. Many of the difficulties encountered in comparisons with norms based upon other institutions (such as noncomparability of programs or accounting systems) are minimized when information is available for the same institution over a period of years. Unfortunately, cost studies usually are not initiated until the pressure to make use of them is fairly great. This frequently precludes waiting for the accumulation of information over a sustained period and forces institutions to analyze and use data from only a few past years instead. Until longitudinal records can provide for at least five consecutive years of information, their full usefulness is not achieved. Year to year changes generally are not dramatic. Even when they are, a genuine shift in the pattern of expenditures cannot be ascertained with certainty until several years have passed. Over a period of four or five years, however, trends can become quite clear.

Normative data drawn from other institutions--particularly other institutions of similar size and purpose--can be extremely valuable in providing an additional dimension of interpretation. The normative information becomes markedly more useful if, in addition to the averages for certain types of institutions, the ranges of expenditures also are shown to indicate the extent of variation from the norm.

When an institution compares itself to such norms and finds that its expenditure pattern deviates from the norm, it can then analyze its own program to determine the likely reasons for the deviation. This provides a basis for deciding whether the deviation is one which the institution wants to continue. An institution may find, for example, that it is spending a higher proportion of its money for library than is the norm in similar institutions, but it may also be known that the library was neglected for many years, and that high expenditures simply reflect a rebuilding program. In this case, the institution presumably would want to continue rebuilding until its libraries became comparable with those in similar institutions. At that point the institution would be faced with a new decision: whether to continue to build the library in order to have one that was better than most, or whether to settle for an average library and invest the extra funds in some other activity.

The "best" pattern of expenditures usually is considered to be one in which a high percentage is spent in the "productive" functions such as instruction and libraries. The conventional wisdom says that expenditures for supporting activities such as administration should be relatively low in a well-managed institution. It should also be remembered, however, that there exists an optimum level of supporting expenditures, below which an imbalance is wasteful. An example of this is neglect on regular maintenance of the physical plant so that monies can be spent for other purposes. In many institutions deferred maintenance becomes a serious problem which necessitates heavy expenditures or even replacement of buildings. Administrative expenses also can fall below an optimum level and result in damage to the institution through ineffective leadership and inefficient administration.

## Unit Cost Technique

The second basic technique of budget analysis is computation of the cost for each unit of service rendered. Unit costs can be computed for the institution as a whole (cost for a full-time equivalent student) or they can be computed for functional categories of activity, such as instruction, administration, and libraries. Unit costs serve a different purpose from percentage analyses and the two forms of analysis taken together can be far more helpful than either technique alone.

The purpose of units costs is to facilitate comparisons of several types:

1. Comparisons between years.
2. Comparisons among institutions.
3. Comparisons among units within a single instituton or system of institutions.

A few examples will make these uses clear. One might compare for a series of years in a single institution the costs of chemistry instruction per credit hour taught to see whether unit costs are changing and if so, the nature of the change and the reasons for it. One might also compare these costs between two or more institutions as one way of testing the "justifiability" of the current cost (care must be taken to recognize differences in types of programs, including qualitative differences). And finally one might compare the costs of teaching chemistry with the costs of teaching other subjects, not only within a single institution, but within a number of institutions. This would show not only the fact that a difference exists in the cost of teaching various subjects but also the extent of the difference, whether the difference is greater in one institution than in another, and if so, why.

Three crucial steps in determining unit costs are the following:

1. Selection of the Proper Cost Unit to Use. This can be more difficult than it might be assumed. The unit must be one which can be defined clearly and unambiguously, one for which cost figures can be identified and one which can be related to a clearly identifiable workload unit (see below). A comparison of costs for the operation and maintenance of the physical plant expenses in two institutions might sound plausible until one considers that the category actually is such a conglomerate classification that the causes of variations are not likely to be clear. A much more meaningful measure would be the unit cost of more precisely defined categories, such as the provision of police protection or the cost per square foot of custodial services.
2. The Selection of an Appropriate Work Unit to Use. Here again a good deal of care must be taken. The work unit selected must actually relate to the costs which are involved. For many types of activities a work load measure which involves students or student activity (such as student enrollment in particular classes) would be appropriate, but for others, such as maintenance or custodial services, another type, such as a square foot measurement related to the total area of buildings would be more appropriate. Certain library work loads are most appropriately measured in terms of numbers of books handled.

3. Establishing the Proper Relationship Between Steps 1 and 2. This is an extension of the selection of the proper work unit discussed above. Student credit hours may relate appropriately to a measurement of faculty work load or faculty productivity, but student credit hours do not bear a direct relationship to the workload of administrative offices or to the custodial services.

Unit costs are not susceptible to the same kinds of distortions which can influence percentage analyses. (For example, unit costs for on-campus liberal arts instruction are not affected by the presence or absence of a large agricultural extension program, but such a program inevitably influences a percentage analysis of institutional expenditures.) But unit costs are susceptible to other kinds of distortion. A simple example is found in the case of an instructional department which is teaching to full capacity and is in need of additional faculty. In the year just before the new faculty member is added, the work load will be unusually high (which is the justification for adding the new faculty member) and therefore, the unit cost for producing each student credit hour in the department will be unusually low. In the following year, when the salary of the additional faculty person is added to departmental costs, the unit cost for producing each student credit hour will jump. It would be easy to misinterpret this as a sign of sudden inefficiency. It is instead simply one of the expected fluctuations in unit costs over time. A perceptive cost analyst is aware of this type of fluctuation. He also develops a sensitiveness to the possibility that some costs may be too low rather than too high.

### General Comments on Patterns of Expenditure

Certain categories of expenditure in the uniform classification of accounts are much better defined than others.

Instruction is fairly well defined except for the inclusion of "departmental research" which sometimes creates confusion, especially in large universities where research constitutes a matter of considerable interest and concern. Instruction typically constitutes about 50% of total educational and general expenditures. This percentage tends to be lower in small institutions because of the inherent inefficiency of small operations and also lower in large complex universities where public service, research, and extension activities constitute major program areas. The percent for instruction frequently is higher than 50% in medium-size institutions which concentrate heavily on instruction, with a minimum of competing activities. Salaries constitute 75% to 80% of the instructional category, and therefore any analysis of instruction becomes to a significant extent an analysis of faculty salaries.

Libraries are probably the most fully analyzed segment of the college and university program because of the emphasis librarians themselves place upon the analysis of this activity. Libraries typically take about 5% of the institution's total education and general budget. There is somewhat more stability in this percentage than in the percentages for some of the other functional activities. Of library expenditures approximately 60% goes for salaries. This often is surprising to people unfamiliar with library activities. It is easy to assume that the major expense of library operation would be the purchase of books. Actually the cost of making books accessible to users is greater--and this calls for personnel.

Other categories of expenditure are less well defined. The categories of general administration and general expense probably have caused the greatest amount of trouble. The names used for these categories imply that they represent the cost of administrative overhead in the institution. Rightly or wrongly, Americans tend to believe that administrative overhead is analogous to waste and should be held to a minimum. In fact, however, major items of expense which do not constitute administrative overhead are inclucded in these categories and this has inflated the apparent administrative costs and caused institutions to be subjected to unwarranted criticisms. The category of general expense is the special culprit in this case. Only one of the three sub-categories within general expense, general institutional expenses, actually consists of administrative expenses proper. The subcategory of student services is generally recognized as an important service activity paralleling instructional services and quite unrelated to general administrative overhead. The separation of student services into an independent category would reduce confusion and seems advisable. The subcategory of staff benefits consists of items which in modern-day America constitute an expected form of salary (euphemistically called fringe benefits). It was an administrative convenience to lump these into a single budgetary item when institutions were small, but now that most institutions are large enough for staff benefits to constitute a substantial amount of money, it is desirable to allocate these expenses to departments and offices in the same way that salaries are allocated. Unless this is done, the true cost of the departmental operation is not shown, and inflated administrative cost appears to exist.

Organized activities related to instruction offer a number of problems in financial analysis because many of the activities are in part related to instructional activities (such as a farm which is used in connection with an agriculture program or intercollegiate atheletics which are used in preparing physical education majors for coaching) but are in part used in purposes ( the farm also may provide milk for the dining hall and the intercollegiate athletics program provides entertainment and a public relations vehicle). In some cases these activities are incorrectly classified no matter which category one chooses. Russell and Doi have suggested that this category should be removed from educational and general expenses altogether and should constitute a fourth category under the current fund (along with educational and general, student aid, and auxiliary enterprises).*

Operation and maintenance of physical plant is a conglomeration of varied activities which can be understood and analyzed only if they are broken down into their component sub-categories.

Organized research, and extension and public service are the two functional areas which vary the most from one institution to another. Large complex universities tend to have a great deal of one or both of these activities, whereas most colleges have little or none of either. Any comparison between an institution which does have these activities and another institution which does not have them must take this programmatic difference into account since it will influence the percentage distribution of expenditures for the total institution.

## The Role of Institutional Research in Budgeting

Like many functions of an institutional research office, its responsibilities in the field of financial analysis and budgeting are shared with other university offices. Furthermore, the role played by the institutional research office in some respects is a secondary or supportive role. This supportive relationship is not unlike the institutional research role in connection with faculty studies (where operating responsibility lies with a department head or a dean) and admissions studies (where operating responsibility lies with a registrar or an office of admissions).

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*John Dale Russell and James I. Doi, "Analysis of Institutional Expenditures," College and University Business, October, 1955, p. 27.

Budgetary decision-making is the responsibility of the president, the chief academic officer, and the chief business officer, acting with the assistance of others within the institution. The budgetary role of the institutional research office lies in the collection and/or analysis of relevant information and the conduct of special studies which will assist in budgetary decision-making. Since the budget office also initiates studies of its own, a question can arise as to the appropriate division of responsibilities between the budget office and the institutional research office. In some institutions this could easily degenerate into a jurisdictional dispute. Such a dispute can be avoided if institutional research is conceived of as a "field" of activity in which many university offices may be engaged simultaneously. In an institution which is receptive to the use of research findings in decision-making, the number of needed studies will surpass the capabilities of any single office. Institutional research offices, therefore, have nothing to fear from the fact that operating offices are also conducting studies--they should welcome such studies and coordinate them with the work of the institutional research office itself so as to permit maximum utilization of the information developed.

## APPENDIX A

## Classification of Institutional "Funds"

1. Current funds. Current funds are those funds available for general operating purposes. Current fund expenditures, especially those from the current fund subcategory called "Educational and General," constitute the expenditures which are usually the principal subject for fiscal analysis and budgetary decision-making.

2. Loan funds. As the name implies, loan funds include monies which are loanable to student, faculty, and staff.

3. Endowment and other non-expendable funds. As the name implies, this includes the institution's endowment, plus other monies which for any reason are non-expendable at the current time. Earnings from endowments are expendable, of course, but must be transferred into one of the other funds before they are actually utilized.

4. Annuity funds. Annuity funds are those monies acquired by the institution subject to an annuity or living trust agreement. Upon completion of the annuity or living trust agreement, the remaining funds will become available to the institution for use according to the stipulation in the original agreement.

5. Plant funds. Plant funds are those monies intended for or actually expended for the acquisition of property or buildings for institutional use.

6. Agency funds. Agency funds are monies which do not belong to the institution, but are held in custody for groups such as campus organizations. At most institutions there are a large number of agency accounts, many of them small. The institution acts as "banker" for the campus-related organizations and agencies to whom these funds belong.

# APPENDIX B

## Classification of Educational and General Expenditures

1. General administration. This includes expenditures for the offices of administration such as the governing board, president, vice-president, business office.

2. General expense. This category is further sub-divided into three major sub-categories: (1) student services (offices and activities such as the registrar, student health service, guidance program); (2) staff benefits (group insurance, retirement contract premiums, social security, unless these are allocated to the departments and offices within the institution); and (3) general institutional expense (such offices and activities as the alumni office, publication of catalogs and bulletins, institution-wide convocations, institutional memberships).

   In large and medium size institutions the amount of money which falls in the general expense category can become quite large. Since the category really is a catch-all for a diversified group of expenditures, it often is difficult to explain why the institution's expenditures should be so large for a category which sounds so vague. A modification of the generally accepted classification of accounts to separate student services into a separately identified category appears desirable, as does the allocation of staff benefits to the offices and departments throughout the institution which directly benefit from the services of the individuals receiving these benefits.

3. Instruction and Departmental Research. This category constitutes the heart of the institution's instructional program. It is sub-divided into the separate instructional units (schools and colleges within a large university; or departments within colleges) and then further sub-divided to show a breakdown of expenditures within departments. In addition to faculty salaries, it includes expenses directly associated with the instructional programs, such as clerical assistance and supplies and equipment used in academic departments.

   "Departmental research" is a term which confuses people who are unfamiliar with collegiate budgeting. Departmental research is any academic research that is carried on by members of the teaching faculty without any separate funding for the research project itself. It frequently is asserted that a certain amount of scholarly or research activity is expected of most faculty members. The inclusion of departmental research in the instructional category constitutes a budgetary recognition of this expectation.

4. Organized activities relating to educational departments. This category is intended to include activities such as demonstration schools and farms that are operated by the institution as an adjunct to the educational program of the institution. In so far as these activities are operated for purposes not directly related to educational departments, they should be listed under auxiliary enterprises. Often the distinction is hard to make. A farm may be operated for several purposes--as a laboratory for agricultural instruction and also to provide food for the dining halls. Intercollegiate athletics may be operated in part as an adjunct to physical education instruction and in part as a self-supporting activity for the entertainment of students and the general public. When the total amounts of money involved are significant, as frequently is the case in intercollegiate athletics, the choice between classifying the activity as "related to instruction" or as an auxiliary enterprise can significantly affect the distribution of institutional funds among "educational" and other types of expenditures.

5. Organized research. Research units and projects which are separately organized and funded, such as agricultural experiment stations, engineering experiment stations, and separately funded research projects fall into this category.

6. Extension and public service. Separately organized and funded extension and public service activities appear here.

7. Libraries. In addition to the main library, any subsidiary libraries which are separately organized should be included in this category.

8. Operation and maintenance of the physical plant. Expenses associated with the operation of the building and grounds and their maintenance are included here. This includes utilities.

# FUTURE ENROLLMENTS AND PLANNING

L. Joseph Lins
Wisconsin Coordinating Committee for Higher Education

Making enrollment projections for any institution is not a simple assignment. As much care must be exercised in their preparation as is true of any research. The problem, as well as its basic assumptions or postulates, should be stated and defined. A hypothesis or hypotheses, after being formulated, should be evaluated in terms of agreement or lack of agreement with observed facts, and should be tested for logical consistency. After testing, each hypothesis is restated and retested. Objectivity is the keynote.

I believe that no college can use the presently available national projections of enrollment and/or college-age population data as the best source of information on which to base its estimates of future college enrollment. The national data have been correct in indicating that, collectively, higher educational institutions can expect substantial increases in enrollment. It is questionable, however, that those projections can be interpreted even nationally in terms of how much the increase will be. It is doubtful that state or institutional estimates will be as accurate when based upon national projections as when based upon conditions prevailing at the state or institutional level.

All factors related to the enrollment of a particular institution must be considered. Those factors must be analyzed and, as far as possible, controlled in order to do the best job of forecasting. It is often assumed in national projections, for example, that the undergraduate college-age pool consists of individuals who are 18 through 21 years of age. Generally it is true that a greater proportion of college undergraduates are in this age range than in any other four-year age range. It is questionable, however, that the enrollment in any undergraduate college or collection of colleges consists of an equal proportion of the youth at each of the ages 18 through 21.

It is evident that education beyond high school encompasses a much wider age range than the four-year span immediately following high school graduation. The socio-economic change following World War II changed the pattern of college attendance. Many persons older than the traditional college-age group are entering college for the first time or are returning to college for further education in order to compete in business, science, and industry. There has been an increasing emphasis upon post-baccalaureate education to meet the demands for better prepared persons in research positions and specialized occupations.

A second major problem in national projections of enrollment has been inadequate definitions of a student. Definitions of enrollment and conceptions of what is requested on an enrollment questionnaire have changed. Not all institutions are using a uniform definition in reporting. Projections made from incomplete and unreliable basic statistics are subject to the inadequacies and limitations of those statistics. All too frequently there has been no distinction made between on-campus and extension center or branch campus students, between full-time and part-time students, between day and late-hour students, or between regular class and correspondence students.

A third difficulty in national projections is that the system for making the national projections is frequently applied to the states within the nation. The migration of potential or actual students is not uniform from state to state, nor are the population survival rates the same for all states.

The enrollment projection must be campus based since it will be dependent upon the aims and purposes of the campus, the long-range goals of the campus, the ability of the campus to attract students from a pool of potential college-going individuals, and the ability of the campus to hold those students until the completion of the academic sequence. Projections should be made likewise for the entire state: (1) as a check against the individual college and university projections, since the sum of the projections of the individual institutions should reflect the potential for the entire state--being neither larger nor smaller, (2) in order that total educational planning for the state can be carried on realistically--this may result in, or be predicated upon, total master planning.

The projection, as I indicated, must be based upon the best data available for and the best knowledge possible of future planning. Educational policy does not remain static, nor should it. Some of the areas for which policy decisions are needed prior to the institution making intelligent enrollment projections are:

1. Will the institution limit its enrollment, or is it committed to accept all individuals who meet certain general requirements? Will there be changes in admissions requirements?

2. Will there be, or is there, a plan to change the "mix" of students by class level? Will the institution, for example, to greater degree than previously, concentrate on attracting a higher proportion of graduate students?

3. Will there be an effort to greatly increase the proportion of the institutional effort devoted to research activities?

4. Will new programs, disciplines, or fields of study be added or abandoned over the forecast period?

5. Will there be changes in the geographic area from which students come? Will students who are non-residents of the state be accepted to a greater or lesser degree than in the past? Can changes in the types and numbers of institutions in the state and their influence on the enrollment in the particular institution be forecast? Can one detect tendencies for colleges within the patronage area, or in other states, to restrict enrollments?

6. Can changes in the economic structure of the patronage area be anticipated?

7. Is there evidence that an increasing proportion of youth will be graduated from high school and that an increasing or decreasing proportion of high school graduates will seek to attend the particular institution? Will a higher proportion of students continue for post-baccalaureate or post-doctoral work?

8. Will sufficient housing be available for the number of students who might desire to attend the institution? Is the anticipated building program adequate to provide the necessary instructional facilities?

9. It is possible to secure sufficient qualified staff members?

These are only a few of the questions which the person making an enrollment forecast should attempt to answer prior to making the forecast. If definite answers are not possible, a framework of logical assumptions should be set up using the best data available.

One notes from these questions that the projection of enrollments is not merely a statistical problem. All too frequently, enrollment projections are made by persons not knowledgeable about higher education in its broad scope. In enrollment projection, the statistical study of past enrollment records must be supplemented by knowledge which may be quite non-statistical in nature. Future college enrollments are dependent upon complex factors which are difficult to analyze or on which data are not readily available. Some factors of this type which affect the size of college enrollments are changes in economic and international situations, provision of education benefits and/or loan and scholarship programs, unusual migration, changes in mortality rates, and Selective Service drafts and deferments.

Persons making enrollment projections cannot be aware of the future operation of all factors; consequently some error in projection might be expected. It is a continuous responsibility to make and revise enrollment projections.

You will note that I speak of projections or forecasts rather than predictions. The projection represents a normal or mean trend during the period of projection and is based upon specified assumptions. For any given year within the forecast period, it can be expected that the actual enrollment may fall above or below the projected trend line. However, if the projection is a good long-range projection, the total positive errors should be about the same as the total negative errors about the trend line. In making projections, and depending upon the uses to which those projections are to be put, it may be well to try to anticipate the variations through projecting a high, medium, and low enrollment number for each point (year) for which a forecast is made; these will usually result from varied assumptions.

I would like to distinguish also between potential and estimated enrollment. Potential enrollment is used in long-range planning to indicate the number of college students which the institution might attract from the total persons expected to desire a college education in a geographic area. Estimated enrollment is used in short-range instructional and budget planning and is dependent upon factors such as the facilities and staff currently available or expected to be realized during the forecast period and the size of the current student body by class.

I have indicated that the forecast is based upon a well thought-out formulation of assumptions. Unless this is true, the forecast may be mere guesswork or speculation. A large amount of reliable, detailed, and relevant data upon which to base the assumptions is essential. Good forecasts will call for logically integrated, analytical techniques.

Thorough consideration should be given to the purpose of the forecast prior to collecting data and formulating assumptions.

If the purpose of the forecast is to determine future instructional staff needs, there should be a clear definition of faculty effort (sometimes called work load) and a knowledge not only of the mean number of credits per student but also of the relative sizes of classes. Facts should be available on the number and distribution of credits carried by full-time and part-time students as well as the time of day students desire and can attend classes. It may be necessary to define students and faculty in terms of full-time equivalents.

As I mentioned, the person making the enrollment projections must be aware of the purposes and plans of the institution for which the projection is made. He therefore should be informed of administrative decisions as those decisions are being made. Those decisions are related to the conditions over which the institution has control. A college, for example, can control the size of its student body through an arbitrary ceiling on admissions, through increased tuition and/or fees, through higher admission and academic standards, through adjusting the proportion of in-state to out-of-state students admitted, through changes in academic offerings, etc.

There are, however, conditions over which the college has little or no control. Among those conditions are population changes and shifts in population, military crises, economic change, and modifications of the social structure. If, for example, there is a sudden shift toward higher educational requirements in the labor force or if employers give increasing priority to job applicants with a college education, the potential demand for college education will be increased.

A sudden upward shift in a state's economy usually results in more college applicants. On the other hand, numerous institutions have found that during the first years of a recession or depression there is a tendency for more students to seek college admission; if the depression continues, it can be expected that there will be a downward shift in college attendance unless scholarship and loan programs provide the funds not otherwise available. Several recent studies have indicated that the proportion of academically qualified students who will attend college is more closely related to the education of the parents than it is to the wealth of the families. Thus if, within the area from which the students are drawn, there are industrial changes which cause a shift in the amount of education of the labor force, it can be expected that there will be a change in the proportion of high school graduates who will attend college.

I can hardly pass without saying a few words about the effect on senior colleges of the increase in the number and enrollments of junior colleges. Kelsey (1967), in a report to the Association for Higher Education on March 6, 1967, stressed the fact that "Nearly one freshman in three is beginning his college work in a junior college. . . . In the period 1960-65, enrollment in junior colleges increased at a rate nearly twice that of four-year institutions." There also is a changing mission, in some states, of the vocational-technical institutions in their becoming a part of the system of academic higher education.

Two effects of the increase in junior colleges are (1) an increasing number of youths enrolled in collegiate program, because when a campus is set up in an area some persons who otherwise would not attend college find it possible financially to try themselves out in collegiate work and (2) a change in the senior colleges to higher proportions of upper-class students. The latter change does affect the average quality of staff needed and the composition of instructional space at the senior college. Knowledge of those changes is important in projections of staff needs and facilities. The projections of course sequences and content also are affected by those changes, as well as by another important fact that students coming to college are better prepared with each generation; therefore the college curricula need to be upgraded.

Private institutions as well as public institutions have to take into account, in projections, the state and federal funds available for scholarships, loans, and facilities.

We conceive the mission of an institution to be teaching, research, and service. For most institutions, the student is the _most_ important product. We have a responsibility to see that he is educated to the maximum of his ability and that his preparation is directed to his being most productive in the local, state, national, and international effort. Collectively institutions have a responsibility to see that all individuals have an opportunity for the best preparation for life.

There are approximately six million students enrolled in degree credit United States colleges--about 1.2 million more than were enrolled five years ago. Even though it can be expected that the college population will increase at a decreasing rate in the immediate future, we can reasonably expect that in the next five years enrollments will rise by about 1.5 million students.

Not all colleges have prepared for increasing enrollments. This may have been by choice, by lack of foresight, or by poor projections. If through lack of foresight or poor projections, this certainly represents poor research on the potential for students, for, according to the National Association of State Universities and Land-Grant Colleges (1967), there are a number of state universities (mostly in the East) which expect to turn away qualified in-state students this fall; the numbers are as follows: University of Connecticut (400), Georgia Institute of Technology (100), University of Georgia (150), University of Illinois (502), University of Maine (200), University of Massachusetts (4,000), University of Missouri (1,210), Rutgers University (3,150), Pennsylvania State University (2,250), and Virginia Polytechnic Institute (1,100).

These figures present only part of the problem for as the result of some states not preparing adequately for enrollments, institutions in other states are turning away large numbers of qualified non-resident students. As reported by the National Association of State Universities and Land-Grant Colleges (1967), 28 of the 99 State Universities and Land-Grant colleges expect to turn away out-of-state applicants this year. Some of the largest numbers of expected non-admittees per institution are: University of Colorado (5,000), University of Connecticut (2,500), University of Delaware (2,000), Purdue University (1,500), University of Kansas (600), University of Maine (700), University of Massachusetts (1,000), Michigan State University (1,000), University of Michigan (2,500), University of New Hampshire (1,300), Rutgers University (850), Ohio University (850), Pennsylvania State University (2,250), University of Vermont (2,200), and University of Wisconsin (650). Eight institutions, all of them east of the Mississippi River, received at least six out-of-state applications for every out-of-state freshman they plan to admit.

It has been said that students make up the college. At least they are its most important product. For some colleges, students are the only or nearly the only product, since little attention is devoted to research and service.

We need to know the characteristics of students and changes in the types of students--their intellectual capacity, their educational aspirations, and the socio-economic status of the families from which they come.

Since students are an important product, since the total aim of the institution must be kept in mind in projections, and since the projections are developed for functional purposes, it may be well at this point to emphasize briefly some of the purposes of data gathering and projections.

1. Is the institution serving the students it should be serving? Are students from impacted areas being given adequate educational opportunities? One function then, is to determine the needs for financial aids--loans, scholarships, and work programs--and the needs for student services.

2. What are the needs for facilities? Will departments choose to restrict enrollments? Will the student "mix" and teaching, research, and service functions change? In planning, one must develop space guidelines and keep the guidelines current. The projections serve as a base for determining the size of classes; size of classrooms; the number of laboratories versus the number of classrooms; the size and types of offices; the amount of space for libraries, research, archive and equipment storage, inactive areas (such as space being remodeled), buildings and grounds service, student service, campus hospital and health, gymnasium and fieldhouse, auditoriums, theaters, museums, and laboratory schools. Some types of space are related quite directly to the number of students. Head count enrollment projections are necessary in determining space such as parking facilities,

dining facilities, student service space, gymnasium and field house seating, and residential facilities.

3. A third area is that of budget planning. Here it goes without saying that there must be projections or, in the case of the annual or biennial budget, estimates of enrollment by department, by level of student, by sex, by full-time equivalent students, and by credit hours.

4. This leads us, then, to a fourth purpose of projections and estimates---that of determining the size, quality, and differential abilities of the staff.

Needless to say all of these projection areas are dependent one on the other. The best information should be available on all factors about which knowledge can be available.

## Sources of Information Relative to Population and College Enrollments

There are numerous sources of information relative to population and college enrollments. Before any of these sources are used, it is essential to discover whether the available information is applicable to the college or collection of colleges for which enrollment projections are desired. Some sources of population and enrollment data are:

1. Bureau of the Census, U. S. Department of Commerce, Washington, D.C.
2. National and state educational associations, regional boards, and coordinating committees for higher education. The organization of state agencies and the information available may vary from state to state.
3. Philanthropic foundations.
4. Insurance companies. Particularly useful may be the mortality or survival tables.

5. The U. S. Office of Education, Department of Health, Education, and Welfare, Washington, D.C. It should be kept in mind that these enrollment data presumably include all students or all students taking work creditable toward a degree; consequently, the enrollment data may be more inclusive than is desired for a particular projection.

6. Some states have an agency which collects enrollment data from all colleges within the state; quite frequently this is done by a representative of the regional association of the American Association of Collegiate Registrars and Admissions Officers.

7. State and national departments of public health (Vital Statistics).

8. The office of the Register of Deeds of the various counties--birth records.

9. Various institutional bureaus of research or offices of institutional studies.

10. State departments of education. Many state departments of education have only public school--elementary and secondary--enrollment figures. In some states, it is very difficult to obtain the enrollment count for private elementary and secondary schools.

11. The American Council on Education, 1785 Massachusetts Avenue, N.W., Washington, D.C. 20036.

12. The reports of Ronald Thompson, The Ohio State University, especially Enrollment Projections for Higher Education, 1961-1978 (The American Association of Collegiate Registrars and Admissions Officers, September 1961), pp. xi + 36.

Thompson's publications are useful if one is concerned with a general measure of enrollment potential. The reports are more useful on the national level than on the state or institutional level but have some limitations.

Weighting was not done by age even for the narrow age-range used. Adequate correction for migration and mortality also was not made. The most significant contribution of these publications has been that they have emphasized the need for long-range educational planning and for immediate consideration of providing for rapidly increasing enrollments.

13. Student migration reports, especially Residence and Migration of College Students, Fall 1963 (Washington, D.C. 20202: U. S. Department of Health, Education, and Welfare, Office of Education, July 1964).

I want now to go into a short discussion of enrollment projection techniques. This can be elaborated upon as we find time, during the workshop, for questions and exchange of ideas.

## Enrollment Projection Techniques

There are four methods in use for making enrollment projections: (1) curve-fitting, (2) ratio, (3) cohort-survival, and (4) correlation analysis. In practice, the best technique for a particular institution or state or the nation may be a combination of these methods.

### Curve-Fitting Method

Enrollment projections by the curve-fitting method consist of determining the functional relationship which exists between past enrollments and years. This functional relationship then is projected to the year or years for which the potential enrollment number is desired. It is assumed that enrollment trends, based upon historical enrollment data, will continue and that the influences of the recent past are indicative of the factors which will operate in the future. The enrollment of the past according to time may take the form of one of many curves.

I will not attempt today to speak about the curves which might fit the data. I would refer you rather to my publication, Methodology of Enrollment Projections for Colleges and Universities (Lins, 1960).

## Ratio Method

The ratio method determines the ratio between the persons enrolled in college and the college-age population of which those persons are a part. This method has been used widely but, as generally employed, is inferior to the cohort-survival method. The ratio method can be, but seldom is, used to forecast freshman, sophomore, junior, senior, etc., enrollments separately. More generally the ratio used is that found by dividing the total college enrollment by the total college-age pool, defined as all individuals in a geographic area who are 18-21 years of age or 18-24 years of age; done in this way, the projections are quite useless.

An age pool in which each age is given equal weight more frequently than not is a poor representation of the population from which the students come since the proportion of students at each age in any given institution is rarely the same. A better estimate can be made by weighting the patronage area population by age according to the relative weighting of ages within the college enrollment grouping.

To employ the ratio method, it is necessary to have past and present data relative to the number of individuals in the college-age range, which is representative of the college enrollments, and to have historical information concerning the weighted proportion of the college-age range population which attended the college or collection of colleges for which the projection is being made. There should be separate projections for undergraduate and for post-baccalaureate--graduate and professional--students.

The enrollment grouping for which the projection is desired must be analyzed carefully over a period of years. The sex distribution by age and by class should be determined. In order to discover the population to be used as a basis for the projection, the enrollment should be distributed according to the geographic areas from which the students come. These areas may be high schools for the commuting college, or counties or parishes for the college attracting students from wide areas; the area may encompass a number of states. When the area or areas from which the students come is determined, the next step is to evaluate whether or not there has been a consistent pattern in the distribution of students by area. The present college-age population of the area or areas and the anticipated college-age population should be known. The latter may be based upon births corrected for deaths and migration. The college-age population figures are weighted according to the proportion of students from each area by age.

## Cohort-Survival Methods

The word "cohort" is used to designate a group of individuals having a similar classification trait. The cohort-survival technique is a method based upon the extent to which a group of individuals survives by grade from first grade through college (grade-succession) or upon the extent to which a group of individuals survives by year of age from birth through the age of college graduation (age-survival). In the ratio method, for each calendar year, one ratio is computed between the college-age pool and the persons enrolled in college. In the cohort-survival method a system of ratios is set up to determine the college enrollment for each calendar year; for example, in the grade-succession method, respective ratios of second grade to first grade, of third grade to second grade, of fourth grade to third grade, etc. are computed. Thus the cohort of a particular year is followed through grade succession until the senior year in college and perhaps on to post-baccalaureate college years.

### Combined Ratio and Cohort-Survival Method

I believe that for many institutions a grade-to-grade or an age-to-age survival technique is not sufficiently superior to a simpler and less cumbersome combined ratio and cohort-survival method to warrant the extra effort. If the problem is to project enrollments through all levels of education from first grade through college, then there seems to be no reasonable alternative to a complete grade-to-grade or age-to-age survival method. However, if the problem is only one of projecting college enrollments, it may be satisfactory to set up direct experience ratios of survival from birth to 17, 18, and 19 year olds. This assumes that the new freshman class in a college is composed primarily of 17, 18, and 19 year olds from a readily identifiable area. The ratio of new freshmen to the population of 17, 18, and 19 year olds, weighted according to the proportion of 17, 18, and 19 year olds among the new freshmen, is determined for the past few years. It is noted that this procedure, through building up an experience trend over a period of years automatically considers the factors of mortality, migration, and desire for college attendance. The assumption is made that the effects of mortality, migration, and desire for further education in the future will be the same as in the past.

From the new freshman enrollment, a cohort-survival (grade-succession) method is used to determine the size of the total freshman and the sophomore, junior, and senior classes.

Correlation Analysis

The correlation analysis method is an attempt to determine the association between enrollment (dependent variable) and one or more independent factors or variables. It may be found, for example, that university or college enrollment varies concomitantly with the number of high school seniors and per capita income. The variation in enrollment may be closely related to a single variable or to a combination of variables. In any event, zero-order coefficients of correlation would be computed between the dependent variable of enrollment and each of the several independent variables. If it were found that there is a significant concomitant association between the dependent variable of enrollment and two or more of the independent variables taken separately, a correlation matrix consisting of the intercorrelations should be set up.

## Short-Range Estimates of Enrollment

The primary purpose of a short-range estimate of enrollment is to provide an annual or biennial basis for budget preparation and educational planning. At the institutional level this may involve college or school, class, and departmental estimates of enrollment.

In my own basic short-range estimates, I estimate by class, sex, and college or school with current entrance divisions of continuing, reentering, advanced standing, and new. A combined ratio and cohort-survival method is employed. New freshmen (residents of the state) by sex and college or school are estimated for the Madison campus by developing the ratio between new freshmen and the weighted 17 and 18 year olds in the state as of April 1; this is practical since the Madison campus attracts students from all areas of the state. By policy, the Madison campus in the past has accepted one non-resident new freshmen for each two resident new freshmen; therefore the estimated number of resident new freshmen was merely multiplied by 50 per cent to arrive at the estimated number of non-resident new freshmen. We now are allowing only 30 per cent non-residents among new freshmen; therefore the non-resident number is increased by 42.9 per cent to arrive at the total new freshmen.

For the University of Wisconsin-Milwaukee, the ratio method also is used, but the ratio is one between new freshmen and Milwaukee high school graduates, since the UWM is primarily a commuting institution and only about two per cent of the new freshmen are non-residents of the state. There is an additional problem, however, in that about 14 per cent of the UWM undergraduate students are evening part-time students.

The continuing, reentering, and advanced standing students by class, sex, and college or school then are computed using the cohort-survival technique. In all phases of the estimation, policy changes are reflected in the estimates.

## Long-Range Projections of Enrollment

Unless there are drastic changes downward in economic and social conditions, changes in mobilization patterns, and changes in the desire of the college-age youth to attend college, it can be expected that there will be a continuing increase in collegiate enrollments. The present increase in enrollments is due at least in part to an increasing population, particularly in that part of the population which is of college age, and to an increasing proportion of the population which actually attends college. We can expect at present, of course, a leveling off of the size of the new freshman group. In a few years again there will be a substantial increase in new freshmen.

During the years after World War II, the birth rate rose. The increased number of births was only one of the factors contributing to larger enrollments.

At the present time, economic conditions are favorable, there is an increasing demand for college graduates, and there is a marked tendency in the direction of increased family size among college-educated parents. It is known that a larger proportion of children whose parents have a college education attend college than of children whose parents do not have a college education.

There must be continuous careful planning for increased college enrollments. Each state, and each institution within the state, must analyze its enrollment potential and, on that basis, must plan as thoroughly as possible the means for serving its students. For some institutions this will involve the construction of many new buildings; however, brick and mortar alone will not suffice to guarantee high quality education. The need for instructional staff also must be recognized. It not only is necessary to prepare the persons who desire to become teachers, but it also will be necessary to make the teaching profession sufficiently attractive to hold the present teachers and to attract a larger proportion of college graduates to teaching.

For some institutions instructional and administrative costs are directly related to enrollment size. In other institutions, particularly those with large evening and/or part-time programs, total enrollment is a quite unsatisfactory basis on which to estimate instructional costs. In all institutions a better index for budget preparation may be faculty effort (load) data and number of credits taught. The number of students classified in a particular college or school within a university, for example, may be little related to the number of credits taught or students served by that college or school.

Departmental budgets usually are more closely related to student credits taught and adviser loads than to the number of students classified in the department. Dr. John Stecklein has discussed faculty studies including defining, measuring, and estimating faculty work effort, and Dr. James Doi has discussed campus planning and facilities analysis. Dr. James L. Miller spoke to the topic of research and institutional budgets. Therefore I will not go into those areas.

That increases in enrollment can be expected is important in alerting the people of this nation to the needs of higher education. Even more important are educated projections of how great the enrollment increases might be at any particular time. Enrollment projections must be based upon the best possible data supplemented by a set of well-integrated and well-founded basic assumptions. The data as well as the assumptions will vary from state to state and from institution to institution. It is recognized that no single method of long-range enrollment projections will meet the needs of all states or all institutions. The method to be used must be determined by persons who have a good background in projection theory, who understand demographic data, and who are aware of the educational needs of the particular state or institution. The projections should be reviewed and, if necessary, revised periodically in order to take into account changing conditions.

The validity and reliability of enrollment projections are somewhat related to the size of the population area and to the length of the projection period. As the size of the population area is decreased and as the length of the projection period is increased, the reliability of the projection generally decreases. Thus long-range projections for a state are usually more reliable than for a city or county. Also projections 10 to 15 years into the future are less reliable than are estimates for a shorter period of time. In a small population segment, very rapid changes in migration, mortality, and economic conditions may occur; these changes usually occur more slowly in an entire state, for the loss through migration in one area may result in an increase in population in another area.

Enrollment projections can be made as far as 17 years into the future without estimating births. Nearly all individuals who will be enrolled in colleges and universities 17 years from now are born and can be counted.

## References

Kelsey, Roger R. "An Analysis of Publications on Higher Education," Annual meeting of the Association for Higher Education, March 6, 1967.

Lins, L. J. *Methodology of Enrollment Projections for Colleges and Universities*. Washington: American Council on Education, 1960.

National Association of State Universities and Land Grant Colleges. *Circular No. 102*, April 13, 1967

# PROJECTIONS FOR CAMPUS PLANNING[1]

L. Joseph Lins
Wisconsin Coordinating Committee for Higher Education

Projection of the potential student population at a college or university is one of the prerequisites to planning campus development. Instructional workloads, the number of faculty required, and the physical plant and land requirements of an institution clearly are affected by the size of the student body which the institution undertakes to serve and by the total mission of the institution. Instructional workloads are a function of the level and distribution of student enrollments. The space required for instructional effort (general classrooms, laboratory-classrooms, laboratories, seminar rooms, studios, and instructional gymnasia) is tied to contact hours in each course (subject) in the institution.

The amount of other types of space needed also is affected by the size of the student enrollment. Some of these types of space are office space, library space, research space, archive and research equipment storage, inactive space (such as space being remodeled), buildings and grounds service space, student service space, campus hospital and health facilities, gymnasium and field house seating, auditoriums, theatres, museums, and laboratory schools.

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[1] Adapted from: L. J. Lins and Allan P. Abell, "Projections of Enrollment for Campus Planning" (Appendix C of A Methodology for Determining Future Physical Facilities Requirements for Institutions of Higher Education, U. S. Department of Health, Education and Welfare, U. S. Office of Education, Project No. 2920, Contract No. OE-5-10-291, December 1966).

Since some types of space are related quite directly to the number of students, head count enrollment projections are necessary in addition to the contact hour type of projection. This would be true of space such as parking facilities, dining facilities, student service space, gymnasium and field house seating, and residential facilities.

If the projections of total students are to be most useful, it will be necessary to have those projections divided by sex, by single and married, by class, and by school or college.

For estimating research space needs, it is essential to have projections of graduate enrollments divided by department and lower level (pre-masters), upper level (pre-doctoral), and post-doctoral. It is important, too, that projections of FTE (full-time equivalent) students be made by level of student (lower level--freshmen and sophomores; upper level--juniors, seniors, and specials; graduate; and professional--law, medicine, veterinary medicine, etc.). The number of staff and type of staff are related to FTE students by level.

In our first session this afternoon, we developed the general pattern of projecting enrollments. We will assume at this point that we already have projections of enrollment by sex and by class for the institution. These projections can be broken into college and school projections by class and sex within the institution where for men, for example:

The Projection by School or College Within the Institution

(A) = the current year and (B) - four years previous, i.e., the fifth year of enrollment data of the past, and

$X_{1m}$ = males in the class in the College of Letters and Science;

$X_{2m}$ = males in the class in the College of Engineering;

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$X_{Nm}$ = males in the class in college N

$X_{1m(A)}$ therefore is the males for the respective class in the College of Letters and Science in the current year.

$Y_A$ = the male enrollment in the class for all colleges in year A and

$Y_B$ = the male enrollment in the class for all colleges four years previous.

The changing ratio of total enrollment for males by class by college then is determined according to the following formula, illustrated for the College of Letters and Science:

$$\frac{X_{1m(A)} - X_{1m(B)}}{4} = \text{acy or average change per year}$$

The average change per year then is applied to the current ratio to obtain the ratio for each year within the forecast period. For the first year for men by class in the College of Letters and Science the new ratio would be:

$$\frac{X_{1m(A)}}{Y_A} + 1\ (\text{acy})$$

For the second year, it would be:

$$\frac{X_{1m(A)}}{Y_A} + 2\ (\text{acy});\ \text{etc.}$$

These ratios then would be applied to the projected enrollment total by sex and class as projected by the institution for the respective year to arrive at the expected enrollment by college, by class, and by sex and adjusted in the summation of all colleges to arrive at the institutional projection of the total.

The table (Table I) developed then for each projected year would show the enrollment by class and sex, by college, as follows:

TABLE I

PROJECTED ENROLLMENT BY CLASS, BY SEX, BY COLLEGE
FIRST SEMESTER OF YEAR 19  -19

| College | Freshman | | Sophomore | | Junior | | .... | | Graduate | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M | W | M | W | M | W | M | W | M | W |
| Letters and Science | | | | | | | | | | |
| Agriculture | | | | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| College N | | | | | | | | | | |
| TOTAL | | | | | | | | | | |

Each college or university, in analyzing trends, may find that the foregoing requires the introduction of judgmental factors and a changed procedure based upon policy decisions about relative growth of individual units of the institution. This is illustrated in Appendix A, which gives the design for the 1974 projections for the Madison Campus of The University of Wisconsin.

## Projection of Graduate Students

Since there is a relationship between the number of graduate students and the amount of staff and space required for each department, it is essential to project graduate students by department.

A doctoral candidate generally requires more research space for his doctoral work than does the masters candidate for his research work. Also, doctoral candidates generally are involved to greater degree in funded research than masters students are. Therefore, the departmental projection of graduate enrollment must be divided according to masters and according to doctoral candidates. It is essential also to survey the departments for the best data possible on post-doctoral researchers.

For the projection of graduate students, one surveys the current and past majors by department at the pre-masters and pre-doctoral levels. This survey should be by sex as illustrated in Table II.

TABLE II

GRADUATE MAJORS BY DEPARTMENT
FIRST SEMESTER OF YEAR 19 -19

| Major Field | Masters Candidates | | | Doctoral Candidates | | |
|---|---|---|---|---|---|---|
| | M | W | Total | M | W | Total |
| Accounting | 40 | 1 | 41 | 14 | 2 | 16 |
| Actuarial Science | 8 | 1 | 9 | -- | - | -- |
| African Languages & Literature | 2 | 1 | 3 | 3 | - | 3 |
| Agricultural Economics | 41 | 2 | 43 | 54 | 1 | 55 |
| . | | | | | | |
| . | | | | | | |
| . | | | | | | |
| Zoology | 50 | 22 | 72 | 36 | 14 | 50 |

If the survey of a five-year period of majors shows no appreciable change in the ratio of men to women, in the ratio of masters to doctoral candidates, or in the proportion of graduate students by level enrolled in the various departments, the enumeration of total graduate students (without regard to sex) by level and department for the year just previous to the projection period can be used. If it were found that the ratio of men to women has changed appreciably, that the ratio of masters to doctoral candidates has changed, or that the proportion of students registered in the various departments has changed a great deal, a changing ratio (acy) will need to be developed as talked about in projecting school or college enrollments within the institution; the proportion then would be a departmental "acy" projection stratified by sex and by level of graduate student. This would be the same procedure as the illustration of males, by class, by college of "The Projection by School or College Within the Institution."

If it were found that there had been no appreciable change over time in the ratios of men to women, of masters to doctoral candidates, and of the proportions of graduate students registered by department, the procedure is a simple ratio procedure with the ratios developed on the basis of the distribution of graduate students by level and by department for the year immediately preceding the projection period. In this event, the total graduate enrollment of the year immediately preceding the projection period would be used as the base of the series of ratios as follows:

Graduate Projection

$Y_0$ = total graduate enrollment;

$X_{1M}$ = masters enrollment in department 1;

$X_{1D}$ = doctoral enrollment in department 1;

.
.
.

$X_{NM}$ = masters enrollment in department N;

$X_{ND}$ = doctoral enrollment in department N.

The ratios for the year immediately preceding the forecast period then would be:

$$\frac{X_{1M}}{Y_0};\ \frac{X_{1D}}{Y_0};\ .\ .\ .\ \frac{X_{NM}}{Y_0};\ \frac{X_{ND}}{Y_0}$$

These ratios then would be applied to the total graduate enrollment for the respective years of the projection period (Table I). These years are $Y_1$ = first year, $Y_2$ = second year, . . . $Y_N$ = last year of the projection period. For the first year, the projected enrollment by departments would be:

$$\frac{X_{1M}}{Y_0} \cdot Y_1; \frac{X_{1D}}{Y_0} \cdot Y_1; \quad . \; . \; . \; . \; \frac{X_{NM}}{Y_0} \cdot Y_1; \frac{X_{ND}}{Y_0} \cdot Y_1$$

This procedure provides, through summation, the total masters level students and the total doctoral level students for the institution.

Again, it is noted that a particular school or college may need to vary its projection technique from that above. In the projections for the Madison Campus of The University of Wisconsin an alternate method was used (See Appendix B).

### Projection of Enrollment by Course

Course (subject) enrollments are related to the college and year (freshman, sophomore, etc.) of the students. Some institutions may find it desirable to break the relationship down to an even finer division, e.g., student classification (EE1, AMP1, PRC1, COM3, etc.). This would be true in institutions where there are a small number of colleges and schools and where students are classified into specific disciplines at the freshman level. In many institutions, however, most freshmen and sophomores are classified into very broad categories (general BA, general BS, General College, etc.) and these students do not major or transfer to a semi-professional college until the beginning of the junior year. This would be true, for example, of students transferring into the School of Education, School of Commerce, School of Pharmacy, etc., after a year or more required in a liberal arts college. Therefore, we will discuss only the college-class breakdown.

The course enrollment and the number and variety of courses will be affected by the policy decisions of the institution. However, for the purposes of the methodological procedure presented, it is assumed that the proportionate enrollment by course, by college and class level, as of the year prior to the projection period is indicative of the proportionate distribution by course, by college and class level, for the future. There will be changes in courses offered. Some courses will be offered only once every two or three years, but it is reasonable to assume that students of respective colleges by class level will enroll in courses which require relatively the same types of facilities as are required at present. Also, since it is difficult, if not almost impossible, to anticipate changes over as much as a 10 to 20 year period in disciplines offered, it is advised that the projections be updated yearly.

Ordinarily, the enrollment projections will be for day students only. It is assumed, then, that the facilities required for day students will also take care of the evening enrollment. Only in institutions having a larger evening program than day program, per hour, will it be necessary to project evening enrollments. It should be kept in mind, however, that even under the assumption of the facilities for day students taking care of the evening programs, certain special purpose classrooms may have to be developed for the evening program. If Extension classes meet on the campus and if the Extension students are not included in the regular enrollment projections, it will be necessary, too, to program space for the Extension instructional activities.

The basic format for the course enrollment projection is the tabulation of the number of students, in the first semester of the year immediately preceding the projection period, from each college by class level (LS1, COM3, ENG2, etc.) enrolled in the respective courses. A ratio is established between the course enrollment by respective class and college and the enrollment in the college for that class. The projected class enrollment by college for the respective year is multiplied by the ratio of the respective class-college enrollment in the course to the respective class-by-college enrollment for the year immediately preceding the projection year. The respective results of the multiplications are summed to arrive at the total course enrollment for the respective projection year. As indicated, first semester data would ordinarily be used since, in most institutions, the first semester or quarter enrollment is larger than any subsequent semester or quarter enrollment of the year. This assumes that first semester or quarter facilities will meet the needs of any subsequent semester or quarter of the year.

The first step, then, is to secure current data on first semester course enrollment divided by class and college. This would be reported as follows:

### TABLE III

### COURSE ENROLLMENT BY CLASS AND COLLEGE
### FIRST SEMESTER OF YEAR 19 -19

| Department and Course | Freshman | Graduate |
|---|---|---|
| | L & S Agric....Pharm | L & S Agric....Pharm |
| Anthro 100 | | |
| Anthro 105 | | |
| . | | |
| . | | |
| . | | |
| Zoology 961 | | |

Step two is to develop the ratios between the respective class-college enrollments in the respective course and the respective class-college enrollments of the first semester of the year immediately preceding the projection period (Table I): for example, the L & S freshman enrollment in Anthro. 101 ÷ by the L & S freshman enrollment.

Step three is to apply the respective ratios by course developed in step two to the projected enrollments by class and college for year X. This will give the projected enrollment by class and college for the respective course in year X.

Step four is to sum the college enrollments for the respective class for the respective course.

Step five is to sum the course enrollments by class for the respective department.

The result of steps four and five will be a table of enrollments by class, by course, and by department as presented in Table IV for year X.

## Projection of Contact Hours by Type of Facility

Table IV is the base for projecting contact hours in that it presents the total enrollment by course. The next step is to develop the contact hours generated by each course. For example, and hypothetically, Anthropology 100 is a three-credit course with an enrollment of 300, broken into one lecture and 12 discussion-quiz sections. The lecture section meets twice a week for one hour, and each discussion-quiz section meets for one hour per week. There is generated by this course 600 student contact hours per week in lecture and 300 student contact hours per week in discussion-quiz.

The summation, by department, of the number of student contact hours by type of instructional facility gives the total contact hours by type of facility for the department. The summation of the total contact hours by type of facility for all departments within the college gives the total contact hours by type of facility for the college, and the summation of the college contact hours by type of facility gives the total contact hours by type of facility for the campus.

## TABLE IV

### ENROLLMENT BY CLASS, DEPARTMENT, AND COURSE
### FIRST SEMESTER 19 -19

| Department and Course | Fresh. | Soph. | Jr. | Sr. | Spec. | Grad. | Law | Med. | ... | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Anthropology 100 | | | | | | | | | | |
| Anthropology 105 | | | | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| Anthropology 999 | | | | | | | | | | |
| TOTAL ANTHROPOLOGY | | | | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| Zoology 101 | | | | | | | | | | |
| Zoology 125 | | | | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| . | | | | | | | | | | |
| Zoology 961 | | | | | | | | | | |
| TOTAL ZOOLOGY | | | | | | | | | | |
| TOTAL ALL COURSES | | | | | | | | | | |

## Projection of Full-Time Equivalent (FTE) Students

The need for teaching staff for a department is a function of the students to be taught. Since the rank and type of instructor is dependent upon the level of students taught, it becomes necessary to develop FTE student counts by student level. Here again, the department is the basic unit.

Student level is defined as lower level (freshman-sophomore), upper level (junior, senior, and special), professional (law, medicine, etc.) and graduate. For purposes of illustration, we will define the number of FTE students at the undergraduate and professional levels as the number of credits carried per semester divided by 15. The number of FTE students at the graduate level is defined as the number of credits carried divided by eight. It is true that the normal load for graduate students is 9-12 credits for full residence. However, due to the numbers of students who have completed their course work and who are registered for only two credits of research while working on the dissertation, the average number of credits is reduced to eight. This will vary with institutions, as will the number of credits used for full-time equivalency vary with the type of "turn-around" or academic calendar setup (semester vs. quarter).

The FTE students by course are computed, the FTE students by courses within the department are summed to give the FTE students by department, the FTE students by departments are summed to give the FTE students for the college, and the FTE students for the colleges are summed to give the FTE students for the campus.

The illustration is for a course with a department in which LL = lower level credits; UL = upper level credits; P = professional credits; and G = graduate credits. The formula then is:

$$\frac{LL}{15} + \frac{UL}{15} + \frac{P}{15} + \frac{G}{8} = \text{FTE students}$$

Referring to Table IV, the enrollment by class, by course, was derived. The average number of credits for which the course is offered must be secured. For example, Anthropology 100 is a three credit course. If that course enrolls 125 freshmen, 75 sophomores, 50 juniors, 20 seniors, 15 special students, and 15 graduate students, there are (125 x 3) + (75 x 3) lower level credits, (50 x 3) + (20 x 3) + (15 x 3) upper level credits, and (15 x 3) graduate credits, or

$$\frac{(125x3)+(75x3)}{15} + \frac{(50x3)+(20x3)+(15x3)}{15} + \frac{(15x3)}{8} = \text{FTE students}$$

$$\frac{600}{15} + \frac{225}{15} + \frac{45}{8} = 40.0 + 17.0 + 5.6 = 62.6 \text{ FTE students.}$$

There are 40.0 lower level, 17.0 upper level, and 5.6 graduate FTE students.

Some will contend that the formula for FTE students for the above purpose should reflect a variable student credit load because of large numbers of laboratory courses in some departments, or because the per semester students load to be graduated in one college in normal progression is higher than in another college. I feel that this should not affect the formula. Differences rather are a function of the variable standards for teaching loads of the various departments. The teaching load standard, therefore, should reflect the differences if such differences in standards can be proven to be valid.

# APPENDIX A

## METHOD OF PROJECTION BY CLASS, SEX, AND COLLEGE FOR MADISON CAMPUS OF THE UNIVERSITY OF WISCONSIN

### Undergraduate Projection

At the present time, for the Madison campus of The University of Wisconsin, a simple long-range projection of undergraduate enrollments by colleges and schools on the basis of recent changes in the proportions of the total undergraduates enrolled in each college or school would be a questionable procedure due to the large proportion of students enrolled in the College of Letters and Science (66.2% in fall, 1965) and the unusually large increase in the proportion of total undergraduates enrolled in that college over the past five years. The use of this method, at this time would result in an unrealistically high proportion of the undergraduates (80.6%) expected to be enrolled in the College of Letters and Science by the fall of 1974.

Under the assumption that the current rate of growth in the proportion of the total undergraduates enrolled in the College of Letters and Science will not continue, and that possibly a reduction in the proportion of total undergraduate enrollment in the College of Letters and Science may occur at some time during the next nine years, an alternate method of long-range projection of college and school enrollment by class and sex gives results that seem more reasonable. The alternate method uses the most recent proportions of total undergraduates by class and sex enrolled in the College of Letters and Science and applies those proportions to the institution's expected total enrollment by class and sex for the projection semester (here fall, 1974) to arrive at the expected enrollment by class and sex for the College of Letters and Science. The other colleges and schools are allotted the remaining projected students by class and sex according to their recent pattern of growth.

The general procedure for the other colleges and schools, as outlined below, was to record the five most recent fall semester enrollments for each college or school for the lower division (freshmen and sophomores) and the upper division (juniors, seniors, and specials) without any sex distinction. The average year-to-year rate of increase (or decrease) was calculated along with the average enrollment for the five years for the lower and upper divisions, respectively, for each college or school. The average rate of increase was projected to the projection semester and then it was applied to the recent five-year average enrollment in each division in each college or school. If a division within a college or school had experienced a steady uniform growth in enrollment, without any decreases, and no restrictions on enrollment could be anticipated for that college or school, the five-year average enrollment could be expected to be in the middle of the projection history period, so the average enrollment had to be projected an additional two years. Thus, "two" was added to the number of years involved in the projection before multiplying by the average rate of increase, to account for the recent growth from the average enrollment. In the case here, the projection is for nine years, so the average increase was multiplied by 11 for those divisions that have experienced a steady uniform increase in enrollment over the previous five years. For the divisions that had experienced increases and decreases in enrollment, the average five-year enrollment is the best base estimate, and the projection was only for nine years in advance; the average rates of increase (or decrease) for these divisions were multiplied by nine.

The lower and upper division projected totals for each college or school were broken down into class and sex according to the class-sex proportions for the recent five years. Each class and sex group was summed over the colleges and schools to arrive at tentative totals. Such totals might not agree with the institution's expected totals (with the projected Letters and Science students subtracted), and in fact did not. Thus each tentative college or school projection was increased or decreased by a constant projection within each class-sex division to arrive at the expected class-sex totals for the projection semester.

The sexes were combined for the basic projection because of the erratic enrollment patterns for women in some colleges or schools (such as Engineering) and for men in others (such as Nursing). Lower and upper division were used instead of straight class divisions for two reasons. First, undergraduate majors generally are not determined until the junior year at The University of Wisconsin, and second, erratic fluctuation in enrollments in some colleges and schools are smoothed out by combining the two classes.

There was a slight deviation from this general procedure for the College of Engineering and the School of Nursing. The average enrollment increases and the average enrollments were based on the most recent four years, rather than the most recent five years. The School of Nursing had experienced a recent rapid increase in enrollment which is not expected to continue, while the College of Engineering had experienced a decrease in enrollment which at the present time appears to be reversing. In addition, the average growth rate of enrollment in the School of Nursing was cut in half because of the anticipated restriction of enrollment in the School of Nursing.

This system gives conservative growth (or decrease) estimates in that the average increase rates are not applied to successive yearly expected enrollments, but are multiplied by the number of projection years and applied to the average base-period enrollment. The result is that sizable recent enrollment changes that are not likely to continue have less influence than if successive yearly expected enrollments were used with the increase rates.

## General Procedure

1. Letters and Science

    a. Calculate the most recent proportion of total fall undergraduates enrolled in the College of Letters and Science for each class-sex division.
    b. Apply these proportions to the respective class-sex divisions of the campus projection for the projection semester. (This gives the expected Letters and Science enrollments for each class-sex division.)

c. Subtract the expected Letters and Science enrollments from the campus projected enrollments for each class-sex division. (This gives the remaining projected students to be allotted to the other colleges and schools.)

2. Other Colleges and Schools

   a. Record the fall undergraduate enrollments for the most recent five years for each college or school according to lower division and upper division (i.e., total freshmen and sophomores--men and women--in Agriculture; total juniors, seniors, and specials--men and women--in Home Economics, etc.).
   b. Starting with the second recorded year, divide each year's enrollment by the previous year's enrollment for each division within each college or school. (This gives four yearly rates of increase (or decrease) for each group.)
   c. Average these four yearly increases in proportion for each group and multiply these averages by the number of years to be projected. Add one to each projected increase rate to obtain the projection factors. (This merely causes the average enrollment to be included when these projected increase rates are applied to the average enrollments.)
   d. Average the five-year enrollments for each division within each college or school and apply the respective projection factors (from 2c) to these averages. This gives the tentative projections for divisions within colleges and schools.
   e. Calculate the five-year average class-sex proportions for the two divisions within each college or school for the five-year period. (In the lower division of Agriculture, for example, divide each of the total male freshmen, the total female freshmen, the total male sophomores, and the total female sophomores for the five years by the total freshmen and sophomores enrolled in Agriculture for the five-year period.)
   f. Apply the proportions arrived at in (2e) to the tentative projection for the respective divisions within colleges and schools (step 2d). This gives the tentative class-sex projections for each college or school. (These are tentative since they have to be weighted on the basis of the class-sex pool anticipated for the campus for the projection semester.)
   g. Sum each tentative class-sex projection (step 2f) through the colleges and schools to arrive at the tentative class-sex totals.
   h. Divide each class-sex remainder (step 1c) by the respective tentative class-sex totals (step 2g) to arrive at the scaling factor for each class-sex division.
   i. Apply the appropriate scaling factor (step 2h) to each tentative college or school projection (step 2f) within each class-sex division. These, then, give the class-sex projections for the non-Letters and Science colleges and schools and when added to the Letters and Science projections should agree with the campus undergraduate class-sex projection for the projection semester.

## Graduate Projection

The projection of the fall 1974 graduate enrollment by sex and college for the Madison campus of The University of Wisconsin was done by a method similar to that used for the undergraduate projections for that period. Graduate student enrollment in all colleges and schools had, in general, increased during the five-year projection base period (1961-1965). Consequently, for each college or school, the average rate of increase in enrollment during the five-year period was calculated along with the average enrollment for the five years. To project the enrollment by college or school at the end of the nine-year period (fall 1974), the average rate of increase over the five-year period was multiplied by 11 and then applied to the five-year average enrollment to arrive at the tentative college or school projected enrollment. The projection factor of 11 was used instead of nine to account for the recent (two year) growth in enrollment from the five-year average enrollment figure.

The tentative projected enrollments for each college or school were summed to arrive at a tentative total. Each college or school tentative projected enrollment was increased by a constant proportion to make the total enrollment agree with the campus projected total graduate enrollment.

The sex division within each college or school projection, with the exceptions of the College of Letters and Science and the School of Pharmacy, was arrived at by using the average sex proportions during the five-year projection base period. The sex division within the College of Letters and Science was arrived at by a different process because of the steady and fairly sizable growth in the proportion of females enrolled during the five-year period. For this college, the average increase in the proportion of females for the five-year period was calculated. Due to the likeliness that the growth in the proportion of females will not continue indefinitely, the average increase in the proportion of females was divided by two and then multiplied by 11 to arrive at a projected increase in the proportion of females enrolled in the College of Letters and Science. This projected increase was added to the five-year average proportion of females and this factor was applied to the projected Letters and Science enrollment to arrive at the projected number of females enrolled in the College of Letters and Science in the fall of 1974.

The sex division of the School of Pharmacy enrollment projection was also treated in a different manner than for the other colleges and schools. There was a small but steady increase in the proportion of females in that school during the five-year base period, so the latest proportion of females (fall 1965) was used to establish the sex division rather than trying to project an increase in the proportion of females.

## APPENDIX B

The method of calculating the most recent (fall 1965) sex-degree level-major to total graduate enrollment ratio was not used in projecting the fall 1974 graduate majors by sex and degree level for the Madison campus of The University of Wisconsin, since there are a large number of majors and since for some majors the number of graduate students within a sex-degree level division is extremely small. An alternate method was used which allotted the projected college or school enrollment on the basis of the most recent (fall 1965) degree level-major history within the college or school.

The first step in the alternate method was to record the most recent history of majors according to level of degree for each college or school. Next, for each college or school, the ratio of total graduates with a given major to the respective total college or school enrollment was calculated. These ratios were used to allot the projected total graduate enrollment within the college or school to the projected graduate majors. Degree level was then determined by the proportion of masters and doctoral candidates in the most recent history previously recorded, in each college major.

# DATA REPORTING[1]

L. Joseph Lins
Wisconsin Coordinating Committee for Higher Education

This workshop has given us an excellent overview of institutional research--research which, broadly conceived, results in self-studies of all forms of institutional operation. Any and all subject matter areas and their interrelationships are involved, as well as the institutional clientele, personnel, and organization. Its concern reaches the boundaries of the community, state, and nation.

Each program, and for that matter the entire institutional program, should be evaluated in terms of enrollment, faculty effort, budget, space utilization, class scheduling, teaching methods, curricular needs, student classification and achievement, attraction of students and faculty, follow-up studies of graduates, contribution to the national and international effort, etc.

In the institution there must be a student body competent to profit from the program of instruction and, by the same token, disciplines which meet the needs of the students. There must be qualified and dedicated faculties. There must be well equipped laboratories and classrooms of a size conducive to most fruitful learning and the operation of best teaching methods. There must be a sense of security on the part of the faculty derived from adequate salaries, fringe benefits, security of position, and rights of academic freedom. There must be money wisely budgeted and efficiently and effectively spent. There must be public relations programs alerting the public to the needs of higher education.

---

[1] Some parts of this material are reproduced, with permission of the author, from L. J. Lins. Methodology of Enrollment Projections for Colleges and Universities, Chapter V (Washington, D.C.: Publications Office, American Council on Education, Copyright 1960 by L. J. Lins).

In all of this, evaluation is extremely important as a guide to continual improvement of all aspects of the institutional operation. This requires a basic program of institutional research affording a basis on which sound decisions can be made. Institutional research does not supplant the need for sound administrative judgment; it make that judgment better informed and more intelligent.

It is important to collect and analyze many types of data and to present those data in such a way that they can be understood and used.

Various techniques of presentation should be used. Some persons are able to read tables with ease. Other individuals see the data best when presented in diagrammatic form. The advantage of a written page accompanied by a well designed, clear graph is somewhat synonymous to the advantage of a presentation using audio-visual materials rather than mere verbalization. It has been found that visualized material is faster, more dramatic, and easier to remember.

## Tables

The basic objective of a table is to arrange and present data so the reader can grasp the materials rapidly. A tabular form is especially useful when large amounts of data of various classifications are presented. A table is perhaps not the clearest method of presenting material, but it is an efficient method from the standpoint of number of pages in a volume and of having various data located together for comparative purposes. Since many persons do not understand columns and rows of figures and therefore have difficulty in analyzing a table, a clear written or verbal presentation should accompany the table. It must be remembered that in a table the emphasis is upon understandability and gaining the reader's attention. Therefore, the table should be as simple as possible and constructed in such a way that the reader is drawn to what is in the table, not to the art work which might surround the table.

In a particular report, it is well to use a rather consistent form for all tables. The reader then knows what to expect in going from one table to another and does not have to study form before studying content. However, one should not force material into a particular form where some other style might be more appropriate.

Tabulation is preferable to long paragraphs of numbers in the body of a report for the reader generally is more concerned with conclusions than with minute detail. Not all statistical data, however, need be presented in tabular form, particularly if, when presented in the written part of the report, the data contribute to the analysis and do not detract from the ease of reading.

A table should appear as near as possible in the text to the discussion that relates to it since the prime purpose of the table is to give a clear understanding or interpretation of what has been written. The table will follow the reference made to it in the text; it may be on the following page if the page containing the reference will not accommodate the entire table. Reference should be by table number and should include the page on which the table appears if that page is different from the page on which reference is made. It is clearer and more accurate to state, "Table V on page 10 indicates. . ." than "The following table indicates. . . ."

Tables most generally are numbered consecutively with Roman numerals throughout the report (See Table I). The word "table" is capitalized, and

## TABLE I

### ENROLLMENT OF STUDENTS BY SEX, ENTRANCE STATUS, AND COLLEGE AND CLASS
### THE UNIVERSITY OF ______________________, SECOND SEMESTER 1966-67
### (End of Second Week of Instruction)

| Classification | Summary Total | | | | | Men | | | | | Women | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Cont. | Re-Ent. | Adv. Stg. | New | Total | Cont. | Re-Ent. | Adv. Stg. | New | Total | Cont. | Re-Ent. | Adv. Stg. | New |
| COURSE | | | | | | | | | | | | | | | |
| Letters & Science | 7,712 | 7,030 | 325 | 137 | 220 | 4,834 | 4,355 | 249 | 84 | 146 | 2,878 | 2,675 | 76 | 53 | 74 |
| Agriculture | 1,299 | 1,188 | 34 | 26 | 51 | 1,229 | 1,126 | 30 | 25 | 48 | 70 | 62 | 4 | 1 | 3 |
| Home Economics | 502 | 478 | 9 | 8 | 7 | -- | -- | -- | -- | -- | 502 | 478 | 9 | 8 | 7 |
| Commerce | 795 | 745 | 20 | 9 | 21 | 745 | 698 | 20 | 8 | 19 | 50 | 47 | -- | 1 | 2 |
| Education | 1,749 | 1,474 | 112 | 29 | 134 | 761 | 591 | 61 | 9 | 100 | 988 | 883 | 51 | 20 | 34 |
| Engineering | 2,863 | 2,578 | 134 | 64 | 87 | 2,849 | 2,564 | 134 | 64 | 87 | 14 | 14 | -- | -- | -- |
| Nursing | 281 | 259 | 12 | 8 | 2 | -- | -- | -- | -- | -- | 281 | 259 | 12 | 8 | 2 |
| Pharmacy | 264 | 254 | 5 | 2 | 3 | 231 | 223 | 4 | 2 | 2 | 33 | 31 | 1 | -- | 1 |
| Law | 491 | 450 | 27 | 14 | -- | 485 | 445 | 26 | 14 | -- | 6 | 5 | 1 | -- | -- |
| Medicine | 332 | 332 | -- | -- | -- | 308 | 308 | -- | -- | -- | 24 | 24 | -- | -- | -- |
| Auditors | 5 | 2 | 1 | 2 | -- | 2 | 1 | -- | 1 | -- | 3 | 1 | 1 | 1 | -- |
| TOTAL | 16,293 | 14,790 | 679 | 299 | 525 | 11,444 | 10,311 | 524 | 207 | 402 | 4,849 | 4,479 | 155 | 92 | 123 |
| CLASS | | | | | | | | | | | | | | | |
| Graduates | 4,046 | 3,491 | 179 | -- | 376 | 3,329 | 2,882 | 138 | -- | 309 | 717 | 609 | 41 | -- | 67 |
| Professionals | 823 | 782 | 27 | 14 | -- | 793 | 753 | 26 | 14 | -- | 30 | 29 | 1 | -- | -- |
| Seniors | 2,877 | 2,734 | 118 | 25 | -- | 1,989 | 1,878 | 90 | 21 | -- | 888 | 856 | 28 | 4 | -- |
| Juniors | 2,760 | 2,564 | 101 | 95 | -- | 1,879 | 1,729 | 79 | 71 | 00 | 881 | 835 | 22 | 24 | -- |
| Sophomores | 2,666 | 2,434 | 141 | 91 | -- | 1,664 | 1,499 | 107 | 58 | -- | 1,002 | 935 | 34 | 33 | -- |
| Freshmen | 3,057 | 2,750 | 97 | 61 | 149 | 1,768 | 1,557 | 80 | 38 | 93 | 1,289 | 1,193 | 17 | 23 | 56 |
| Specials* | 64 | 35 | 16 | 13 | -- | 22 | 13 | 4 | 5 | -- | 42 | 22 | 12 | 8 | -- |
| TOTAL | 16,293 | 14,790 | 679 | 299 | 525 | 11,444 | 10,311 | 524 | 207 | 402 | 4,849 | 4,479 | 155 | 92 | 123 |

*Special students not classified by year.

both the word and the number are centered above the table. This is followed, two vertical spaces below, by the table title (centered above the table) and with all words in capital letters. If the title is more than one line in length, it is preferable to use an inverted pyramid form; that is, each successive line should be shorter than the previous line. Complete segments of the title appear on a line; phrases, for example, should not be broken between lines. The title should designate what is to be found in the table and should proceed from the general (or population) to the particular and time. Thus the title generally will be in the order of: what, classified how, the location, and the time. A headnote, enclosed in parentheses and appearing between the title and the top rule of the table, may be appropriate in qualifying, or explaining, the title or the table as a whole. In contrast, a table footnote generally qualifies or explains a specific cell, line, column, or segment.

Ordinarily tables of only two columns would not be ruled either vertically or horizontally but the column heads would be underlined. Note the format of Table II. Tables of more than two columns should be ruled with a horizontal double rule at the top, a single horizontal rule between the head or heads and the body, and a single horizontal rule at the end of the table. The minimum vertical rules are those which separate the stub from the field of the table and the segments of the field from one another. Where segments consist of several columns and these are separated by rules, there should be a double vertical rule between the segments.

TABLE II

THE MAJOR PARTS OF A TABLE

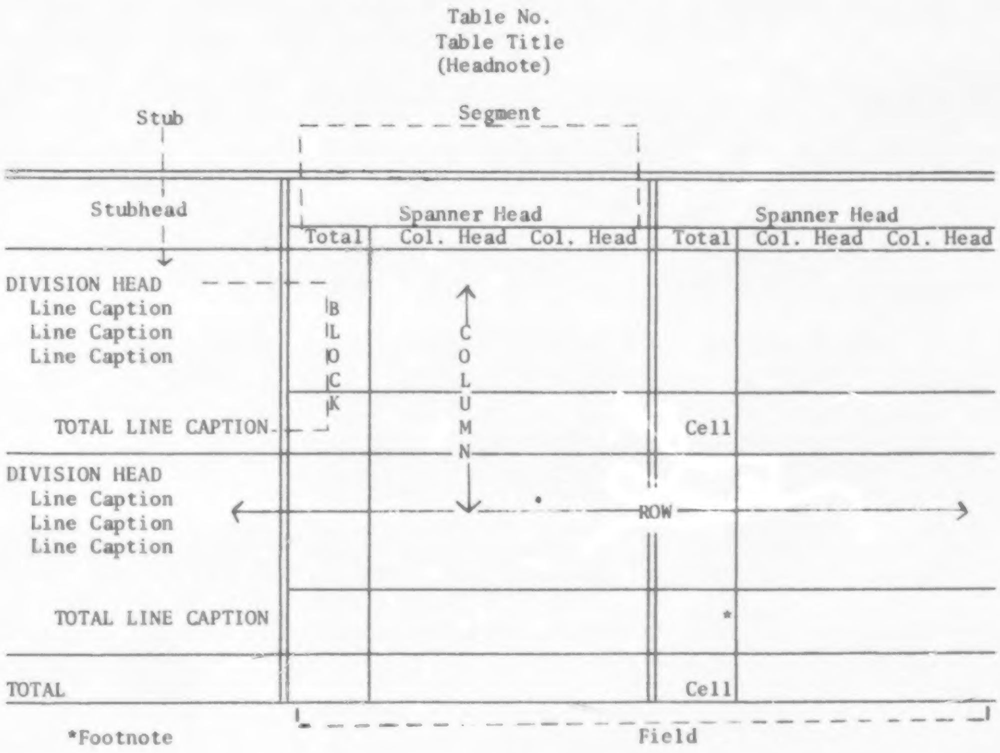


Table No.
Table Title
(Headnote)
Stub
Segment
Stubhead
Spanner Head
Total
Col. Head
Col. Head
Spanner Head
Total
Col. Head
Col. Head
DIVISION HEAD
Line Caption
Line Caption
Line Caption
BLOCK
COLUMN
TOTAL LINE CAPTION
Cell
DIVISION HEAD
Line Caption
Line Caption
Line Caption
ROW
TOTAL LINE CAPTION
*
TOTAL
Cell
*Footnote
Field

It is well to keep ease of reading in mind. Unless there is a good reason to the contrary, the table should have neither a vertical rule for each column nor a horizontal rule for each row; these tend to attract attention away from the numbers in the table. If there are long columns of numbers, they should be broken periodically with an extra type space in order to provide a guide in following a line across the table and to break up the blackness of the page.

Each column heading should be centered within the space allotted to the respective column. Abbreviations can be used throughout the table if these are standard abbreviations which are understood, or if the abbreviations are explained in a footnote to the table. It is often convenient to number the columns in addition to having a column head, since this may facilitate reference in the text to the particular items. In the headings of a segment (See Exhibit I), each lower head should refer solely and strictly to the next higher level, for example:

EXHIBIT I

Correct Heading

| Residence | | | |
|---|---|---|---|
| Resident | | Non-Resident | |
| Male | Female | Male | Female |

| Residence | | | |
|---|---|---|---|
| Male | | Female | |
| Res. | Non-Res. | Res. | Non-Res. |

Footnotes to a table should appear immediately below the table while footnotes for a written page are located at the bottom of the page. It is acceptable, if there are not more than two footnotes for a table, to use an asterisk (*) and/or a dagger (†). If there are numerous footnotes for a table, superscript numbers might be more appropriate. In the text of the report, footnote references are numbered consecutively and appear as superscript numbers.

## Charts or Graphs

The terms "chart" and "graph" frequently are used interchangeably. I will use the terms graphic presentation or graph. Properly the word "chart" is considered as a more general terms than the word "graph" and includes graphs, maps, posters, pictures, diagrams, and cartoons. Graphs are visual representations of numerical data which reveal important relationships in the data. A graph may show trends, or it may show variations from a norm.

The major purpose of a graph is to present comparative, quantitative information quickly and simply. Graphs should be easy to read and, therefore, should not be very complex. When a complex system of numerical data is portrayed, it is better generally to have a series of simpler graphs rather than one intricate composite graph. If a composite graph is necessary, it should be preceded by a series of supporting graphs.

## Bar Graphs

Horizontal bar graphs and column bar graphs are one-dimensional, although the bar is shown to have width. The width of the bar has no relationship to the data; the value or magnitude is determined by the length of the bar. A column graph is identical in purpose to a horizontal graph; the difference is that the bars of a column graph are vertical.

Bar graphs are of two general types: (1) a graph with all bars of equal length, each bar representing 100 per cent, or some other unit, and (2) a graph with bars of varied lengths and with each bar representing an amount of a category. Each bar may be divided and shaded to show the relative amount of the elements of which the total of the bar is composed.

It is recommended that a carefully planned scale and a key (to the shading) be included with the graph. There is no rule as to the width of the bars themselves or the width of the space between bars. A "rule-of-thumb" is that the width of the bars is determined by the size and characteristics of the graph and that the width of the space between bars should be about one-half the width of a bar.

## Plane and Volume Graphs

A plane graph is two-dimensional while a volume graph is three-dimensional. Unless one understands the construction of and computation for proportional representation in these graphs, it is advisable to rely on a one-dimensional form since the representation is more easily drawn proportional to the amount. If a plane graph or volume graph is used, it is important to keep in mind that the area or volume represents the amount. An amount twice the size of a square, for example, would be represented by a square with each side multiplied by the square root of two. Doubling each side would multiply the amount by four; tripling each side would multiply the amount by nine.

A multi-dimensional bar graph pictured on a flat surface to give the illusion of depth is not a volume graph. It does give a certain "life" to the presentation to have bars with "perspective," an illusion of depth. If this conceals rather than points out the facts, it would be much better to rely on a simple bar graph. Graph I illustrates this point.

In Figure 1, the receding depth gives the impression that the amounts are three units higher than they actually are. The first block, under 90 units high, is made to appear like 93.

In Figure 2, the true relationships between the form bars are obscured by depth and shadow. Which do you think is larger, B or C? You may be surprised, unless I have made an error in drawing, that B and C are exactly the same height. The eye is defenseless against this type of graphing which "dresses up" information beyond recognition.

Eye appeal is used in some advertisements to attract attention; however, in so doing, attention often is drawn from, rather than to, the facts. It is important to present the data in such a way that the data will be understood. If color, multi-dimensional graphs, and superfluous art work hide the actual data, the investigator has defeated his purpose.

### Linear Graphs

The most common type of graph for presenting time series is the linear graph in which the plotted points are joined consecutively by straight lines

## GRAPH I

## ERROR IN PERSPECTIVE

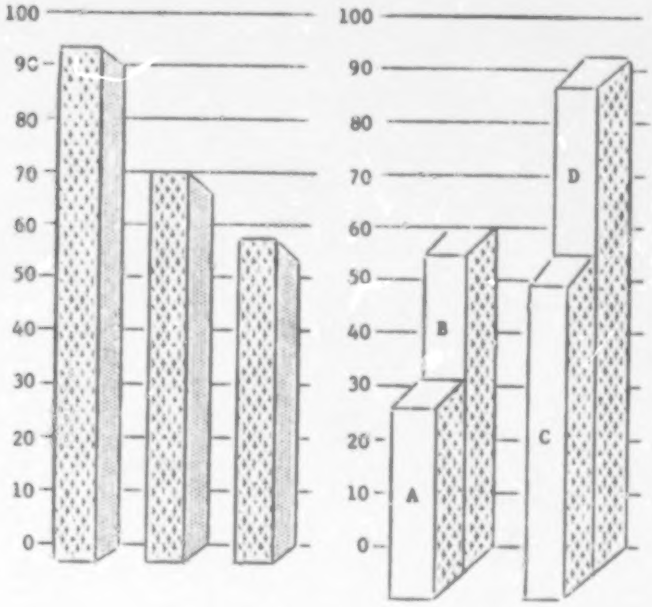


Figure 1 Figure 2

to form a continuous line movement or curve. We will briefly consider two types of linear graphs: (1) those presented in rectilinear coordinate form and (2) those presented in semilogarithmic or ratio form.

In determining the type of graph to be used, one is concerned with the meaning of the data, the purpose of the chart, and the audience to whom the chart is directed.

Rectilinear Coordinate Graph: A rectilinear coordinate graph sometimes is referred to as a Cartesian coordinate or rectangular graph. A rectilinear coordinate system consists of four quadrants. The X (abscissa) axis is horizontal; the Y (ordinate) axis is perpendicular to the X axis. The four quadrants formed by the intersection (origin of coordinates) and extension of the two axes are:

Quadrant I - X values positive and Y values positive.
Quadrant II - X values negative and Y values positive.
Quadrant III - X values negative and Y values negative.
Quadrant IV - X values positive and Y values negative.

Quadrant I is used almost exclusively in graphing. Occasionally, quadrant IV and quadrant I may be used together in order to display values of a directional nature, that is, both positive and negative values of the dependent or Y variable. The X scale generally represents the independent variable; in graphing this is frequently the variable of time.

The base line on all rectilinear coordinate graphs should be zero except where for good reason some other reference value is more appropriate. This occurs, for example, when an index is used and the first year is represented by an index of 100 and all other index values exceed 100; in this case the base line would be 100. In order not to misrepresent the visual picture, the zero base line is important; without it the data appear distorted.

If it is absolutely necessary to omit part of the axis scale, the breaking of the grid must be clearly indicated on the graph and explained in the text. A grid is the area composed of coordinate rulings.

Some producers of graphs attempt to present a very dramatic picture of change and thereby distort the data. If one wants to show a great vertical change, it is only necessary to enlarge the vertical scale and/or shorten the horizontal scale. If one desires to demonstrate a small amount of change in the dependent variable, he can lengthen the X scale and/or shorten the Y scale.

This is illustrated by Graph II. Note the effect in Figure 1 and Figure 2 when the vertical scale is doubled and the horizontal scale is kept the same; also note the effect in Figure 3 when the horizontal scale is doubled and the vertical scale is kept the same.

The producer of graphs should use a lot of good common sense in the scaling. Each graph should be planned individually according to the special characteristics of the data and the particular use to which the graph is to be put. It should always be kept in mind that the person looking at the graph may be swayed by a first impression and may not take the time for an educated analysis.

Index Graph: An index graph is not a true type of graph. The index can be presented on rectilinear coordinate axes or by means of a bar graph. Whereas an arithmetic graph represents an absolute amount, an index compares relative growth or decline with reference to the same starting point or base period. The base is 100; the amount for each subsequent (or preceding) period is divided by the amount for the base period and multiplied by 100. The two time series of enrollments for the university campuses of Table III would be represented by two lines quite a distance apart on an arithmetic scale but would begin from the same base, 1961-62 on an index scale.

## GRAPH II

## EFFECT OF ENLARGING AXIS SCALES

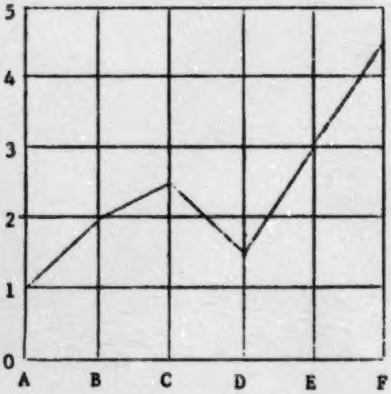


Figure 1

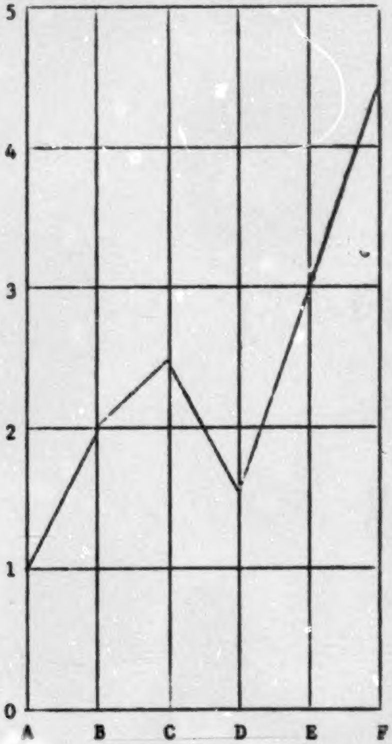


Figure 2

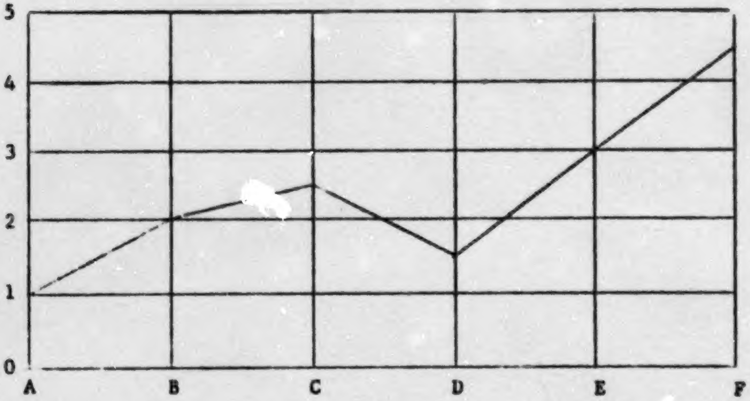


Figure 3

## TABLE III

## ENROLLMENT, CAMPUS A AND CAMPUS B OF UNIVERSITY X
## FALL SEMESTERS 1961-1966

| Year | Campus A |  | Campus B |  |
|---|---|---|---|---|
|  | Enroll. | Index* | Enroll. | Index* |
| 1966-67 | 18,150 | 131.7 | 5,355 | 166.3 |
| 1965-66 | 16,960 | 123.1 | 4,890 | 151.9 |
| 1964-65 | 15,710 | 114.0 | 4,185 | 129.9 |
| 1963-64 | 15,185 | 110.2 | 3,885 | 120.7 |
| 1962-63 | 14,500 | 105.2 | 3,460 | 107.5 |
| 1961-62 | 13,780 | 100.0 | 3,220 | 100.0 |

*Index 1961-62 = 100.

Care should be taken in the interpretation of index data. It is true that the fall 1966 enrollment of Campus B is 66.3 per cent higher than the fall 1961 enrollment (166.3 - 100.0). But it is not correct that the enrollment of Campus B in 1966, for example, is 14.4 per cent higher than that of 1965 (166.3 - 151.9); the actual increase of 1966 over 1965 is 9.5 per cent. The comparison is only in terms of the base or index year.

Semilogarithmic or Ratio Graph: The semilogarithmic graph is a graph in which the horizontal axis is divided into equal or arithmetic rulings while the vertical axis is divided into logarithmic rulings. It is superior for most purposes to either an arithmetic or index presentation. An arithmetic line graph represents only change in absolute amounts; an index graph compares only relative growth or decline with reference to a base period; a semilogarithmic graph represents both absolute amount and relative change at the same time.

One need only understand a few basic principles of common logarithms, that is, logarithms to the base 10, to be able to construct a semilogarithmic graph. In the equation $10^x = N$ (written in exponential form), the exponent $x$ is the logarithm of N. In logarithmic form, $\log N = x$. Therefore the logarithm of 1 = 0; of 10 = 1; of 100 = 2; of 1000 = 3; etc. ($10^0 = 1$; $10^1 = 10$; $10^2 = 100$; $10^3 = 1000$; etc.). A logarithm consists of two parts: (1) the characteristic, or integral part, and (2) the mantissa, or fractional part, of the logarithm. Since concern here is only with positive values of logarithms, only the case of N being greater than 1 will be considered; in this case the characteristic of log N is one less than the number of digits in the integral part of N. For example, the characteristic of 5.24 is 0; of 52.4 is 1; of 524 is 2; etc.

The mantissa of the logarithm of a number if independent of the decimal point in the number and depends only upon the significant digits in the number. Therefore, if the characteristic and mantissa are combined, it is found from a table of logarithms that log 5.24 = 0.71933; log 52.4 = 1.71933; log 524 = 2.71933; etc.

In the construction of a semilogarithmic grid, only the logarithmic values from 1 to 10 are required. It is noted that a rectilinear coordinate grid begins with zero; a logarithmic grid begins with multiples of 10, i.e., 0.1, 1, 10, 100, 1000, etc., since the logarithm of 0 is minus infinity.

Each successive logarithmic grid (cycle or tier) is identical to the previous one except that the corresponding division in each successive grid is 10 times that of the respective division in the previous grid. One final concept is necessary: the common logarithm (logarithm to the base 10) of a number is the antilogarithm of the number's exponent (log 1 = 0, antilog 0 = 1; log 10 = 1, antilog 1 = 10, etc.). The logarithmic value thus can be plotted on a linear scale by using the values on the top of page 189. The width between each division is determined by the value of the logarithm while the designation is that of the antilogarithm.

The range of the antilogarithm for one cycle is 1 to 10; for the second cycle it is 10 to 100; for the third cycle it is 100 to 1000; etc. In graphing, one can have the base line as the beginning of any cycle. The respective distances between each division of a cycle are shown in the semilogarithmic grid of Graph III.

Note that the horizontal scale is divided into equal divisions of time. The vertical scale is divided according to the logarithmic value of the antilogarithm. This is a method of setting up one's own semilogarithmic grid. Semilogarithmic paper can be purchased commercially, but it has the disadvantage of all grid lines being printed. It is useful in setting up the graph, but the complete printed grid detracts from the line formed from the values of the two variables. It also is somewhat inflexible; however, semilogarithmic paper in various cycle sizes can be purchased.

Comparison of Arithmetic, Index, and Semilogarithmic Graphs: To add meaning to the differences in arithmetic, index, and semilogarithmic presentations, the data of Table IV are plotted in Graph IV. Projected enrollments for the two campuses of the same institution are shown on an arithmetic, on an index, and on a logarithmic scale. The two former are parts of rectilinear coordinate graphs and the latter is a part of a semilogarithmic graph with the X-axis in all cases being divided arithmetically according to the variable of time.

| Logarithm | Antilogarithm |
|---|---|
| 2.00000 | 100 |
| 1.95424 | 90 |
| 1.90309 | 80 |
| 1.84510 | 70 |
| 1.77815 | 60 |
| 1.69897 | 50 |
| 1.60206 | 40 |
| 1.47712 | 30 |
| 1.30103 | 20 |
| 1.00000 | 10 |
| .95424 | 9 |
| .90309 | 8 |
| .84510 | 7 |
| .77815 | 6 |
| .69897 | 5 |
| .60206 | 4 |
| .47712 | 3 |
| .30103 | 2 |
| .00000 | 1 |

GRAPH III

SEMILOGARITHMIC GRID OF ONE CYCLE

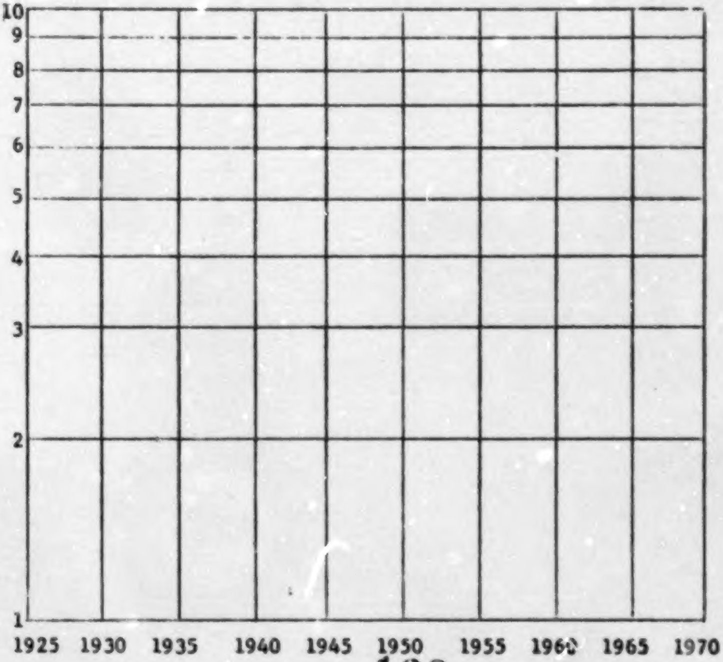


TABLE IV

PROJECTED ENROLLMENTS OF CAMPUS I AND CAMPUS II
OF STATE UNIVERSITY X, 1966-1975

| Fall Term | Campus I | | Campus II | |
|---|---|---|---|---|
| | Enroll. | Index* | Enroll. | Index* |
| 1975-76 | 11,300 | 211.2 | 29,400 | 162.0 |
| 1974-75 | 11,000 | 205.6 | 28,500 | 157.0 |
| 1973-74 | 10,300 | 192.5 | 26,900 | 148.2 |
| 1972-73 | 9,600 | 179.4 | 25,500 | 140.5 |
| 1971-72 | 8,900 | 166.3 | 23,900 | 131.7 |
| 1970-71 | 8,125 | 151.9 | 22,350 | 123.1 |
| 1969-70 | 6,950 | 129.9 | 20,700 | 114.0 |
| 1968-69 | 6,450 | 120.6 | 20,000 | 110.2 |
| 1967-68 | 5,750 | 107.5 | 19,100 | 105.2 |
| 1966-67 | 5,350 | 100.0 | 18,150 | 100.0 |

*Index 1966-67 = 100.

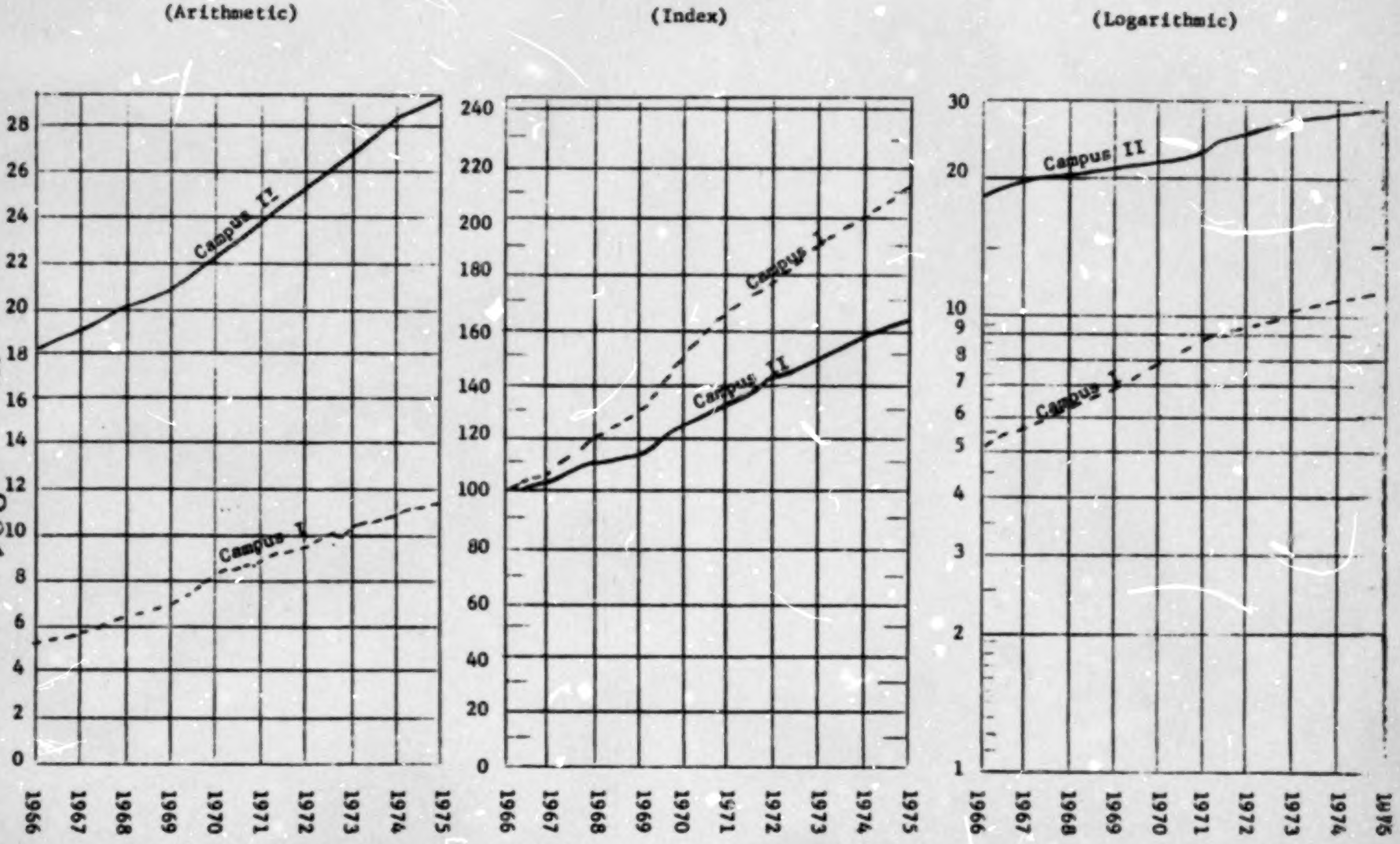
The arithmetic scale (rectilinear coordinate graph) indicates that the numerical change for Campus II can be expected to be greater than for Campus I. It cannot be determined easily whether the rate of change is greater or less. In other words, if instructional cost is directly related to enrollment, this graph would not indicate the relative increases in instructional cost needs.

The index scale (rectilinear coordinate graph) shows that Campus I can be expected to grow relatively more rapidly than Campus II on the basis of the enrollment of 1966-67. It does not show the amount of expected growth. In fact, unless a person observes carefully, he may interpret this graph to mean that both campuses had equal enrollments in 1966-67 but that the expected amount of increase for Campus I is greater than for Campus II.

The logarithmic scale (semilogarithmic graph) shows both relative change and amount of change. On this graph, one notes that both campuses can expect growth, that Campus I is expected to grow relatively faster than Campus II, but that a greater numerical growth can be expected on Campus II than on Campus I.

## GRAPH IV

## COMPARISON OF PROJECTED ENROLLMENTS OF TWO CAMPUSES OF THE SAME INSTITUTION WHEN PLOTTED ON ARITHMETIC, INDEX, AND LOGARITHMIC SCALES



(Arithmetic)

(Index)

(Logarithmic)

It is assumed by some that, since a semilogarithmic graph shows both rate of change and amount of change, it is the best graph to use and should be used for all purposes. This is not true for if it is desirable to show only the amount of change, an arithmetic graph presents a truer picture of the change--a picture which also is easier to interpret. One notes immediately that on a semilogarithmic graph a small vertical change at the top of the graph represents a much larger amount than a small vertical change at the bottom of the graph. The grid of Graph III demonstrates these relative amounts for equal vertical distances. The vertical distance from 1 to 2 is equal to the vertical distance from 2 to 4 and is equal to the vertical distance from 4 to 8, yet the actual amount in each of these vertical divisions is double the amount of the previous division.

In case both the amount and the rate of change are important, it is recommended that an arithmetic graph and a semilogarithmic graph be constructed for the data and presented side by side for the reader.

## A Word of Advice

The method of presentation of data is important. If the data are to be useful, those data should be understood by the reader, or by the audience, to which the data are addressed.

All too frequently it is said that statistics are uninteresting and meaningless. Statistics are the tool, not the end in themselves. Analysis is very significant in enlightened administrative decisions. I feel very strongly that poor reporting procedure is the reason so many people are confused by statistics.

One of the prime principles in data reporting is that the materials should be presented candidly and honestly. The presentation should be understandable to the persons who are expected to use the report; therefore, the report with its accompanying tables and graphs should be "crystal clear." No matter how carefully research is done, if the technique and the results are not presented in a succinct and comprehensible manner, persons who have the responsibility for final decisions may distrust and perhaps disregard the generalizations and conclusions.

Administrators and governing boards are confronted with many elaborate reports each day. It is impossible for them to read all the materials which come to their desks; therefore, if the report can be brief, it is more subject to notice. Also, an attractive and well presented chart or graph may convey a thought which might not be understood even after many minutes of verbalization or many pages of written material. One should plan to provide a carefully prepared summary in addition to the complete report. Many persons will read the summary only.

## ATHENS WORKSHOP ON INSTITUTIONAL RESEARCH

### Roster of Participants

Dr. R. Dean Acker
Director of Research
Eastern Kentucky University
Lancaster Avenue
Richmond, Kentucky 40475

Dr. Leroy F. Anderson
Director of Institutional Research
South Carolina State College
P. O. Box 1722
Orangeburg, South Carolina 29115

Mr. C. Speights Ballard, Jr.
Associate Director of Development
Emory University
Atlanta, Georgia 30322

Mr. Lex Barnett
Registrar
Jacksonville University
Jacksonville, Florida 32211

Mr. Jerry J. Baudin
Research Analyst
Louisiana Staff University
Baton Rouge, Louisiana 70803

Dr. Horace M. Bond
Director, Bureau of Educational and Social Research
Atlanta University
223 Chestnut Street, S. W.
Atlanta, Georgia 30314

Dr. Roberta D. Brown
Academic Dean
Arkansas College
Batesville, Arkansas 72501

Miss Carol Carte
Research Assistant
Office of Research and Program Development
Morehead State University
Morehead, Kentucky 40351

Mr. Francis T. Casey
CORD Program Developer
Marymount College of Virginia
2807 N. Glebe Road
Arlington, Virginia 22207

Dr. Frank H. Chou
Director of Institutional Research
Augusta College
Augusta, Georgia 30904

Mr. James R. Dungan
Director of Institutional Research
The University of West Florida
Pensacola, Florida 32504

Dr. John Harris
Director of Institutional Studies
University of North Carolina at Greensboro
Greensboro, North Carolina

Dr. Edgar W. Hooks, Jr.
Director, Office of Institutional Research
East Carolina College
P. O. Box 2721
Greenville, North Carolina 27834

Dr. D. L. Howell
Vice President for Academic Affairs
Troy State College
Troy, Alabama 36081

Dr. Prince A. Jackson, Jr.
Associate Professor of Mathematics and
Chairman, Special Committee on
Research Proposals and Grants
Savannah State College
Savannah, Georgia 31404

Dr. Walter H. Juniper
Academic Vice-President
West Texas State University
Canyon, Texas 79015

Mr. John Douglas Machesney
Research Assistant
Administration Building
West Virginia University
Morgantown, West Virginia

Mr. S. H. McDonald
Office of the Legislative Auditor
State Capitol
Baton Route, Louisiana

Mr. Robert N. Melott
Director, Data Systems
Junior College of Broward County
3501 Southwest Davie Road
Fort Lauderdale, Florida 33314

Dr. James H. Morriss
Director of Institutional Research
and Testing
McNeese State College
Lake Charles, Louisiana 70601

Mr. Harry J. O'Brien
Research Assistant
Office of Institutional Studies
University of Texas at El Paso
El Paso, Texas 79912

Mr. David F. Osborne
Director of Institutional Research
Montgomery Junior College
Takoma Park, Maryland 20012

Mr. Larry G. Owen
Director, Institutional Research
University of North Carolina at
Charlotte
P. O. Box 12665
Charlotte, North Carolina 28205

Mr. Charles S. Partin
Director of Institutional and
Educational Research
Delta State College
Cleveland, Mississippi 38732

Dr. Charles Pinnell
Associate Dean for Academic Affairs
Texas A & M University
College Station, Texas

Dr. Robert E. Reiman
Director of Institutional Research
and Development
Appalachian State Teachers College
Boone, North Carolina 28607

Dr. Marlow F. Shute
Director of Institutional Research
Bennett College
Greensboro, North Carolina

Mr. William H. Simpson
Assistant to the Dean of the
Faculty
North Carolina State University
Raleigh, North Carolina

Sister Marina Gibbons
Academic Dean, Siena College
Memphis, Tennessee 38117

Sister Mary of the Paraclete
Director of Institutional Research
Xavier University of Louisiana
New Orleans, Louisiana

Sister Mary Veronica
University Dean
Xavier University of Louisiana
New Orleans, Louisiana 70125

Sister Maureen Hughes
Administrative Assistant
Sacred Heart College
Cullman, Alabama

Mr. David F. Snipes
Registrar
Lambuth College
Jackson, Tennessee 38301

Dr. Theo Strum
Dean of Women and Professor of Education
Elon College
Elon College, North Carolina 27244

Mr. William Mack Usher
Director of Institutional Research
Oklahoma State University
Stillwater, Oklahoma

Mr. Robert E. Wall
Assistant Professor of Psychology
Towson State College
York Road at Burke Avenue
Towson, Maryland 21204

Dr. Nofflet D. Williams
Director of Institutional Research
Tennessee Technological University
Cookeville, Tennessee 38501

Mr. J. Williamson
Assistant Professor
Coordinator of Research
Cumberland College
Williamsburg, Kentucky 40769

Mrs. Shirley Wrightsman
Assistant to the Director
Office of University Research
Fisk University
Nashville, Tennessee 37203

Mr. Jim Zowarka
Space Analyst
Office of Academic Services
308 Tigert Hall
University of Florida
Gainesville, Florida 32601